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Official Grain Grading Guide

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Canada

Official Grain Grading Guide

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1. Determining test weight

Test weight is the weight of a measured volume of grain expressed in kilograms per hectolitre.

Equipment needed to determine test weight

0.5 litre measure	A cylindrical shaped cup with an inside diameter of approximately 90 mm and a height of approximately 77.5 mm. The measure is calibrated to contain 500 ml of water, ± 1 mL, at 20°C.
Cox funnel	A funnel with a 3.81 cm opening and a drop of 4.41 cm, from the opening in the funnel to the top of the measure used to uniformly direct the flow of grain into the 0.5 litre cup..
Striker	A piece of round hardwood, 2.2 cm in diameter and approximately 23 cm in length.
Scale	Any CGC approved electronic metric scale.
Computer interface	For CGC inspection purposes, the electronic scale is connected to a computer which converts the grams in the 0.5 L measure to grams per hectolitre. If the computer interface is not available, the test weight conversion can be done by utilizing charts provided by the CGC Statistical unit.
Test weight conversion charts	Used to convert the weight in grams from the 0.5 L measure to kg/hl.

Procedure:

1. Fill the 0.5 litre measure to overflowing with the grain to be tested.
2. Ensure the slide is inserted into the Cox funnel.
3. Pour the contents of the 0.5 litre measure, plus an extra handful, into the Cox funnel.
4. Place the 0.5 litre measure on a solid base.
5. Position the Cox funnel on top of the 0.5 litre measure so that the notched legs of the Cox funnel fit securely onto the measure's rim.
6. Remove the slide on the Cox funnel quickly so that the grain drops evenly into the 0.5 litre measure.
7. Carefully remove the Cox funnel from the top of the 0.5 litre measure so as not to disturb the grain.

   ▲ **Important:** Any jarring of the cup at this point will result in compaction of the grain in the 0.5 litre measure and could produce inaccurate results.
8. Place the hardwood striker on the rim of the 0.5 litre measure and, using three zigzag, equal motions, scalp off the excess the grain in the measure.
9. Pour the grain remaining in the 0.5 litre measure into the scale pan.
10. Determine the weight in grams of the grain in the scale pan.
11. Convert the grams in the 0.5 litre measure to kg/hl.

Note: The CGC conversion formula takes into account the compaction factor of the various grains and is incorporated into the OSCAR and SOS computer software programs and the conversion charts. Doubling the weight of the grain in the 0.5 litre measure and dividing by ten (10) will not accurately predict the kg/hl.

Test weight, except for corn, is determined after the removal of dockage as defined in the cleaning procedures described for each class of grain.

Test weight on corn is determined prior to removal of cracked corn and foreign material. When the Terms of Delivery or terms of a contract state that dockage can be deducted then test weight is determined after the removal of dockage.

Note: Samples are graded *Sample Account Light Weight* only if the test weight is lower than the minimum established for that class of grain and in accordance with the Order of Precedence as stated in the *Glossary* section of the Official Grain Grading Guide.

2. Moisture testing

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Introduction to moisture testing

Moisture testing means analyzing a grain sample for the percentage of moisture contained within it.

Moisture content can affect the test weight and the appearance of the grain. Grain that is too moist is susceptible to deterioration.

Moisture tests are performed on samples free of dockage.

Industry Services will determine the moisture content of grain with a Unified Grain Moisture Algorithm (UGMA) moisture meter or with a Near-infrared transmittance (NIT) instrument. Specific Work Instructions for moisture testing are available to CGC staff at K:\Isqms\QM15 - Work Instructions-Instructions de travail\National-Nationale\English. Model 919/3.5" moisture meter conversion tables continue to be monitored and updated. Conversion tables, moisture calculators and guidelines for using the model 919/3.5" moisture meter can be found at http://www.grainscanada.gc.ca/guides-guides/moisture-teneur/mtgm-mdteg-eng.htm.

Samples testing within 0.5% (+) or (-) of the tough, damp, moist or wet cut off levels, are to be retested three (3) times using different moisture meters when possible. The final reported moisture content will be an average of the three tests.

Moisture Specifications

The chart on the next three pages outlines the moisture specifications and, if the model 919/3.5" moisture meter is used, the conversion table number and representative portion required to determine the moisture content of each type of grain is provided.

Conversion tables are not available for all grains. The following information can be found on the CGC website.

- For wheat, oats and barley samples with low test weight, normal procedures for determining moisture content will give inaccurate results. See *Estimating moisture content for lightweight wheat, oats and barley samples*.
- For samples with moisture values above the range of the conversion table using the 919/3.5" moisture meter, see *High moisture samples*.
- For beans for which there are no conversion charts, see *Beans with no conversion tables*.

Grain	Weight (g)	Conversion table Number (919/3.5")	Moisture Specifications			
			Tough (%)	Damp (%)	Moist (%)	Wet (%)
Barley						
Food (covered) (>52 kg/hl)	225	13	13.6-17.0	over 17.0		
Food (hulless)	225	1	14.1-17.0	over 17.0		
General Purpose (covered) (>52 kg/hl)	225	13	14.9.17.0	over 17.0		
Lightweight (covered) (< 52kg/hl)	200	10	14.9-17.0	over 17.0		
General Purpose (hulless)	225	1	14.9-17.0	over 17.0		
Malting (covered) (>52 kg/hl)	225	13	13.6-17.0	over 17.0		
Malting (hulless)	225	1	13.6-17.0	over 17.0		
Beans						
Azuki	250	1	No tough	over 18.0		
Black	250	2	No tough	over 18.0		
Cranberry	225	2	No tough	over 18.0		
Dark red kidney	250	2	No tough	over 18.0		
Great northern white	250	1	No tough	over 18.0		
Light red kidney	250	1	No tough	over 18.0		
Otebo	250	1	No tough	over 18.0		
Pea Bean	250	2	No tough	over 18.0		
Pinto	250	2	No tough	over 18.0		
Small red	250	1	No tough	over 18.0		
White kidney	250	1	No tough	over 18.0		

Conversion table chart	Weight (g)	Conversion table Number (919/3.5")	Moisture Specifications			
			Tough (%)	Damp (%)	Moist (%)	Wet (%)
Buckwheat	225	3	16.1-18.0	over 18.0		
Canola and Rapeseed	250	6	10.1-12.5	over 12.5		
Chickpeas	250	1	14.1-16.0	over 16.0		
Corn						
Under 19.9% moisture	250	6	15.6-17.5	17.6-21.0	21.1-25.0	Over 25.0
20.0% moisture and over (adjusted moisture value using table 11A result and according to test weight. Refer to page 2-6 for details)	175	11A + 11B	15.6-17.5	17.6-21.0	21.1-25.0	Over 25.0
Fababeans	250	2	16.1-18.0	over 18.0		
Flaxseed	225	7	10.1-13.5	over 13.5		
Lentils						
Green Lentils	250	2	14.1-16.0	over 16.0		
Red Lentils	250	2	13.1-16.0	over 16.0		
Mixed Grain	Use the conversion table and tough and damp ranges for the predominant grain.					
Mustard Seed (Domestic)						
Brown mustard	250	11	9.6-12.5	over 12.5		
Oriental mustard	250	10	9.6-12.5	over 12.5		
Yellow mustard	250	9	9.6-12.5	over 12.5		
Oats						
Hulled oats	200	6	13.6-17.0	over 17.0		
Hulless oats	200	1	13.6-17.0	over 17.0		
Lightweight oats (<48 kg/hl – calibrate at 73)	140	1	13.6-17.0	over 17.0		
Peas						
Green and Yellow	250	3	16.1-18.0	over 18.0		
Split peas (green and yellow)	250	1	16.1-18.0	over 18.0		
Rye	250	5	14.1-17.0	over 17.0		
Safflower seed (calibrate at 73)	150	1	9.6-13.5	13.6-17.0	17.1-22.0	over 22.0
Soybeans	225	9	14.1-16.0	16.1-18.0	18.1-20.0	over 20.0
Sunflower seed (calibrate at 73)	150	3	9.6-13.5	13.6-17.0	17.1-22.0	over 22.0
Triticale	250	1	14.1-17.0	over 17.0		

Conversion table chart	Weight (g)	Conversion table Number (919/3.5")	Moisture Specifications			
			Tough (%)	Damp (%)	Moist (%)	Wet (%)
Wheat						
CWRS (>66kg/hl)	250	11	14.6-17.0	over 17.0		
lightweight (<66 kg/hl)	225	9	14.6-17.0	over 17.0		
CWHWS	250	1	14.6-17.0	over 17.0		
CWAD	250	4	14.6-17.0	over 17.0		
CWRW	250	5	14.6-17.0	over 17.0		
CWSWS	250	4	14.6-17.0	over 17.0		
CWES	250	2	14.6-17.0	over 17.0		
CPSW	250	1	14.6-17.0	over 17.0		
CPSR	250	1	14.6-17.0	over 17.0		
CNHR	250	1	14.6-17.0	Over 17.0		
CWSP	Use the conversion table and tough and damp ranges for the predominant class.					
CER	250	1	14.6-17.0	over 17.0		
CERS	250	1	14.6-17.0	over 17.0		
CEHRW	250	1	14.6-17.0	over 17.0		
CESRW	250	1	14.6-17.0	over 17.0		
CEAD	250	4	14.6-17.0	over 17.0		
CEHWW	250	1 (use CEHRW)	14.6-17.0	over 17.0		
CEWW	250	5	14.6-17.0	over 17.0		
CESWS	250	4	14.6-17.0	over 17.0		
CEHWS	250	1	14.6-17.0	over 17.0		

Determining moisture content for special cases

Optional analysis

An optional analysis is the process of determining the weight and grade of grain which would otherwise be assessed as dockage. If a sufficient quantity of grain is available, a moisture test will be done on all grains assigned a grade as part of the optional analysis.

When the grain assigned a grade as part of the optional analysis is not large enough for official moisture testing, and most of the sample is tough, damp, moist or wet, the optional analysis portion is graded tough, damp, moist, or wet without reference to a specific moisture content.

Corn (Model 919/3.5" Only)

See *Determination of dockage* for corn.

1. Remove foreign material and cracked corn.

If the moisture content is...	Use this sieve...
25.0% or less	No. 12 round-hole
25.1 % or more	No. 14 round-hole

2. Choose the appropriate sample size by weight.

If the moisture content is...	Use a sample size of...
under 20.0%	250 g
from 20.0% to 35.0%	175 g

3. Choose the conversion table.

If the moisture content is...	Use conversion table...
20.0% or less	6
from 20.1% to 35.0%	11A - to estimate moisture content based on the dielectric reading and the temperature of the corn 11B - to adjust the preliminary moisture value according to the test weight of the corn sample

3. Specifications for sieves

This table lists the sieves to be used to assess dockage and grading factors.

Sieves for assessing dockage and grading factors

Type	Sieve name	Perforation size (millimetres)	Manufacturer's designation (Fraction of inches)
Round-hole	No. 4.5	1.79	4½/64
	No. 5	1.98	5/64
	No. 5.5	2.18	5½/64
	No. 6	2.38	6/64
	No. 6.5	2.58	6½/64
	No. 7	2.78	7/64
	No. 7.5	2.98	7½/64
	No. 8	3.18	8/64
	No. 8.5	3.37	8½/64
	No. 9	3.57	9/64
	No. 10	3.97	10/64
	No. 11	4.37	11/64
	No. 12	4.76	12/64
	No. 14	5.56	14/64
	No. 15	5.95	15/64
	No. 16	6.35	16/64
	No. 17	6.75	17/64
	No. 18	7.14	18/64
	No. 20	7.94	20/64
	No. 21	8.33	21/64
	No. 22	8.73	22/64
	No. 24	9.52	24/64
Round-Hole Metric	No. 8.0 mm	8.0	N/A
	No.9.0 mm	9.0	N/A
	No. 10.0 mm	10.0	N/A

Sieves for assessing dockage and grading factors

Type	Sieve name	Perforation size (millimeters)	Manufacturer's designation (Fraction of inches)
Slotted	No. 4.5	1.79 x 12.70	4½/64 x 1/2
	No. 5	1.98 x 19.05	5/64 x 3/4
	No. 6	2.38 x 19.05	6/64 x 3/4
	No. 8	3.18 x 19.05	8/64 x 3/4
	No. 9	3.57 x 19.05	9/64 x 3/4
	No. 11	4.37 x 19.05	11/64 x 3/4
	No. 12	4.76 x 19.05	12/64 x 3/4
	No. .028	0.71 x 11.90	0.028 x 15/32
	No. .032	0.81 x 11.90	0.032 x 15/32
	No. .035	0.89 x 11.90	0.035 x 15/32
	No. .038	0.96 x 11.90	0.038 x 15/32
	No. .040	1.02 x 11.90	0.040 x 15/32
Buckwheat	No. 5	triangle with 1.98 mm	triangle with 0.078
	No. 6	triangle with 2.26-mm	triangle with 0.089-inch
Wire	No. 3 x 16	3 x 16 mesh per 25.4 mm	3 x 16 wire mesh per inch
	No. 4 x 14	4 x 14 mesh per 25.4 mm	4 x 14 wire mesh per inch
	No. 10 x 10	10 x 10 mesh per 25.4 mm	10 x 10 wire mesh per inch
	No. 9 x 9	9 x 9 mesh per 25.4 mm	9 x 9 wire mesh per inch

4. Wheat

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Classes and varieties

Class name	Grades	Variety (from the Regulations)
Canada Western Red Spring	No. 1 CWRS No. 2 CWRS No. 3 CWRS	Any variety of the class CWRS designated as such by order of the Commission
Canada Western Hard White Spring	No. 1 CWHWS No. 2 CWHWS No. 3 CWHWS	Any variety of the class CWHWS designated as such by order of the Commission
Canada Western Amber Durum	No. 1 CWAD No. 2 CWAD No. 3 CWAD No. 4 CWAD	Any variety of the class CWAD designated as such by order of the Commission
	No. 5 CWAD	Any variety of amber durum wheat
Canada Western Red Winter	No. 1 CWRW No. 2 CWRW No. 3 CWRW	Any variety of the class CWRW designated as such by order of the Commission
Canada Western Soft White Spring	No. 1 CWSWS No. 2 CWSWS No. 3 CWSWS	Any variety of the class CWSWS designated as such by order of the Commission
Canada Western Extra Strong	No. 1 CWES No. 2 CWES	Any variety of the class CWES designated as such by order of the Commission
Canada Prairie Spring White	No. 1 CPSW No. 2 CPSW	Any variety of the class CPSW designated as such by order of the Commission
Canada Prairie Spring Red	No. 1 CPSR No. 2 CPSR	Any variety of the class CPSR designated as such by order of the Commission
Canada Northern Hard Red	No. 1 CNHR	Any variety of the class CNHR designated as such by order of the Commission
	No. 2 CNHR	
	No. 3 CNHR	
Canada Western Special Purpose	No. 1 CWSP No. 2 CWSP	Any variety of the class CWSP designated as such by order of the Commission

Class name	Grades	Variety (from the Regulations)
Canada Eastern Red	No. 1 CER No. 2 CER No. 3 CER	Any registered variety of red wheat
Canada Eastern Red Spring	No. 1 CERS No. 2 CERS No. 3 CERS	Any variety of the class CERS designated as such by order of the Commission
Canada Eastern Hard Red Winter	No. 1 CEHRW No. 2 CEHRW No. 3 CEHRW	Any variety of the class CEHRW designated as such by order of the Commission
Canada Eastern Soft Red Winter	No. 1 CESRW No. 2 CESRW No. 3 CESRW	Any variety of the class CESRW designated as such by order of the Commission
Canada Eastern Amber Durum	No. 1 CEAD No. 2 CEAD No. 3 CEAD	Any variety of the class CEAD designated as such by order of the Commission
	CE Feed Durum	Any variety of amber durum wheat
Canada Eastern Hard White Winter	No. 1 CEHWW No. 2 CEHWW No. 3 CEHWW	Any variety of the class CEHWW designated as such by order of the Commission
Canada Eastern White Winter	No. 1 CEWW No. 2 CEWW No. 3 CEWW	Any variety of the class CEWW designated as such by order of the Commission
Canada Eastern Soft White Spring	No. 1 CESWS No. 2 CESWS No. 3 CESWS	Any variety of the class CESWS designated as such by order of the Commission
Canada Eastern Hard White Spring	No. 1 CEHWS No. 2 CEHWS No. 3 CEHWS	Any variety of the class CEHWS designated as such by order of the Commission
Canada Eastern Feed	CE Feed	Any class or variety of wheat excluding amber durum

Determination of commercially clean

Dockage is not assessed on wheat samples that meet the commercially clean specifications defined in the wheat commercially clean determinant table. All samples must be analyzed to determine if they meet commercial cleanliness standards prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.05% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean, the sample must be analyzed using the procedures outlined below in steps 1 through 14 to confirm that the sample is not commercially clean prior to assessing dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
2. Place approximately 250 grams of the sample at a time on the No. 5 buckwheat sieve nested over the No. 4.5 round-hole sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All broken wheat passing through the No. 5 buckwheat hand sieve or the No. 4.5 round hole hand sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for broken through a No. 5 buckwheat sieve. (Column #1 in the wheat commercially clean determinant table)
5. Small seeds passing through the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #2 in the wheat commercially clean determinant table)
6. Material other than broken grain and small seeds passing through the 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for attrition. (Column #3 in the wheat commercially clean determinant table)
7. The sample portions remaining on top of the No. 5 buckwheat sieve and the 4.5 round hole sieve are recombined and divided using a Boerner-type divider to a representative portion of not less than 250 grams.
8. The portion divided from step 7 is handpicked to remove large seeds (as defined in the *Glossary)*, roughage and wild oats.
9. The roughage material is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for roughage. (Column #4 in the wheat commercially clean determinant table)

   Note: If the roughage material contains unthreshed wheat heads, the heads are squeezed to remove the kernels of wheat prior to weighing. The wheat kernel is not included when assessing the concentration of roughage for commercial cleanliness. However, care should be taken to keep these wheat kernels separate. If it is determined that the sample is "NCC", kernels squeezed from the unthreshed heads will be included in the dockage.

10. The percentages of small seeds, attrition and roughage are added together to determine if the total meets the commercially clean specification of the grade for total small seeds, attrition and roughage. (Column #5 in the wheat commercially clean determinant table)
11. The large seeds are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for large seeds. (Column #6 in the wheat commercially clean determinant table)
12. The wild oats are weighed and the percentage concentration calculated to determine if they meet the commercially clean specification of the grade for wild oats. (Column #7 in the wheat commercially clean determinant table)
13. The percentages of small seeds, large seeds, and wild oats are added together to determine if the total meets the commercially clean specification of the grade for total small seeds, large seeds and wild oats. (Column #8 in the wheat commercially clean determinant table)
14. The percentages of small seeds, large seeds, wild oats, roughage and broken grain through the No. 5 buckwheat sieve are added together to determine if the total meets the commercially clean specification of the grade (Column #9 in the wheat c commercially clean determinant table)

Should the percentage concentration of any of the factors determined in steps 1 through 14 exceed the specifications set out in columns #1 through #9 of the wheat commercially clean determinant table the sample will be considered to be not commercial clean.

Dockage will be assessed on samples determined to be not commercially clean using the procedures defined in *Determination of dockage* with the following exception. The exception relates to those samples which are determined , by hand sieving, to be NCC because of the concentration of attritional material either alone (Column #3 in the wheat commercially clean determinant table) or as a component of *Total Small Seeds, Attrition and Roughage* (Column #5 in the wheat commercially clean determinant table).

The attritional material from these samples will not be reconstituted back into the sample but will be added to the dockage removed by the Carter dockage tester. This procedure will ensure that attritional material that causes a sample to be designated NCC is not expelled by the fan of the Carter dockage tester and is retained in the sample in the event of a reinspection request.

Note: Large seeds, small seeds, roughage and attrition are defined in the *Glossary*.

Export ready (ER)

Export ready refers to carlots which meet the following criteria:

1. The lot must meet the commercially clean specifications for the grade
2. Wheat of other classes and contrasting classes must meet the export specifications for the grade
3. Total foreign material must meet the export specification for the grade.

Not ready for export (NRE)

Not export ready refers to carlots which are commercially clean but do not meet the export specifications for either wheats of other classes, contrasting classes or foreign material

Determination of dockage

Definitions

Dockage is assessed to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the gross weight of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after the cleaning assessment has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- Wheat, Sample CW/CE/CAN Account Fireburnt
- Wheat, Sample Salvage
- Wheat, Sample Condemned

For *Wheat, Sample CW/CE/CAN Account Admixture*, dockage is not reported for removable material similar in nature to the admixture.

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester with the following specifications.

Feed control	#6
Air control	Minimum #4 (increase according to the nature of the material)
Riddle	No. 25
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No. 5 buckwheat
Sieve cleaner	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples shall be at least 1 kg.
    - Unofficial samples shall be at least 1 kg.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for 2 to 3 seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Remove the aspiration pan.
9. Handpick whole sound threshed kernels of wheat from the portion passing over the riddle and return them to the cleaned sample.

Composition of dockage

Dockage includes

- Wheat with long rootlets, unthreshed wheat heads, and material other than wheat removed by the No. 25 riddle
- Material removed by No. 5 buckwheat sieve in the lower position
- Material removed by aspiration
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

The purpose of this cleaning is not to remove all foreign material, but rather to reduce the admixture of conspicuous separable material to within the grade tolerance.

1. After the cleaning assessment has been completed, examine the material to be removed and select your equipment according to that material. See the table, *Cleaning for grade improvement,* for the list of equipment.
2. Pass the sample through the Carter dockage tester, or sieve the sample by hand, depending on the material.

▲ **Important**: When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage

Cleaning for grade improvement-Wheat

Material to be removed	Equipment	Composition of dockage
Broken kernels	No. 6 buckwheat hand sieve No. 10x10 wire hand sieve	If the weight of broken kernels in the cleaned sample is over the grade tolerance, you can remove up to 5.0% of the gross weight in broken kernels to improve the grade. For example, if a sample of CWRS contains 12% broken kernels by gross weight, you can remove enough broken kernels to bring the percentage to 7%, which brings the sample within the grade tolerance for No. 3 CWRS. Add the maximum 5% broken kernels to dockage. See *Shrunken and broken.*
Bunt balls	Carter dockage tester, using the setup for *Normal cleaning procedures,* but with air control at a maximum setting of 7	If there is no odour, remove bunt balls and add to dockage. If there is an odour, bunt is a grading factor. See *Common bunt.*
All foreign material (other than stones and wild oats)	No. 6 buckwheat hand sieve No. 10x10 wire hand sieve	Add material to dockage, if the grade is improved as a result.
Stones	No. 6 buckwheat hand sieve	If the weight of stones and other material removed is • 5.0% or less of the gross weight, assess as dockage. • More than 5.0% of the gross weight, see *Stones* in Grading factors, or the relevant grade determinants table.
Wild oats	Carter dockage tester, using the setup for *Normal cleaning procedures,* but with No. 1 riddle No. 10x10 wire hand sieve	Everything removed is dockage.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of wheat.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

Example
95.0% Wheat, No. 1 CWRS
4. 0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.

Hazardous substances in sample

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant".

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of wheat for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Artificial stain	250	working sample
Binburnt kernels	250	working sample
Blackpoint	25	50
Common bunt	50	100
Contrasting Classes	50	100
Darkened kernels	50	100
Dark immature kernels	50	100
Degermed kernels	25	50
Ergot	500	working sample
Excreta	working sample	working sample

Representative portion of wheat for grading, grams (cont'd)

Grading factor	Sample portion size range	
	Minimum	Maximum
Fertilizer Pellets	working sample	working sample
Fireburnt	working sample	working sample
Foreign Material	50	250
Fusarium damage	10	100
Grasshopper, armyworm damage	50	100
Grass green kernels	50	250
Hard vitreous kernels, sieving	250	250
Hard vitreous kernels, handpick	10	25
Heated	25	250
Matter other than cereal grains	50	250
Mouldy	100	working sample
Natural stain	50	100
Odour	working sample	working sample
Other cereal grains	50	250
Other cereal grains and other matter	50	250
Penetrated smudge	50	250
Pink kernels	50	250
Rotted	100	working sample
Sawfly, midge damage	10	50
Sclerotinia	500	working sample
Severe midge damage	50	100
Severely mildewed	100	working sample
Severely sprouted	50	100
Shrunken and broken	250	250
Smudge	50	100
Soft earth pellets	working sample	working sample
Sprouted kernels	10	100
Stones	working sample	working sample
Total Damage	25	100
Treated Seed	working sample	working sample
Wheats of other classes or varieties	15	50

Grading factors

Artificial stain (ART STND)

▲ **Important**: Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Artificial stain

- Includes any nontoxic stain on kernels caused by contact with foreign substances such as dye, oil, grease, paint, or soot
- Does not include any stain considered a natural stain
- Does not include any stain caused by coming into contact with poisonous substances, or any stain that could be considered *Contaminated grain*

▲ **Important** If you are uncertain about the identity of the stain, treat the sample as *Contaminated grain.*

Binburnt kernels (BBT)

Binburnt kernels are blackened as a result of severe heating in storage. A cross section of a binburnt kernel maintains its dense structure and appears smooth and glossy. A binburnt kernel is similar in weight to sound kernel.
There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.

Procedures

- Determine the weight of binburnt kernels as a percentage of the net weight of the sample.

Blackpoint (BLK PT)

Kernels with blackpoint have a distinct dark brown or black discolouration of the whole germ and surrounding area.

Procedures

- Disregard a slight discolouration restricted to the germ.
- When the discolouration affects more than one-half of the kernel or extends into the crease, it is considered smudge.

Broken (BKN)

Broken kernels are pieces of wheat that are less than three-quarters of a whole kernel.
If the piece is more than three-quarters of a kernel, it is considered whole.
See *Shrunken and broken*

Common bunt (stinking smut) (SMUT)

Common bunt is a plant disease caused by fungi, characterized by

- Soft black bunt balls
- Kernels tagged with black bunt spores
- A distinct smutty odour, or the smell of rotten fish

Procedures

See procedures for *Cleaning for grade improvement.*

- If samples have a distinct odour, grade *Wheat Sample CW/CE/CAN Account Odour.*
- If kernels are tagged with bunt spores but there is no smutty odour, the sample is *Naturally stained* and graded accordingly.
- Non-removable bunt balls are considered as *Matter other than cereal grains.*

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act.*"

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Wheat, Sample Condemned.*

Contrasting classes (CON CL)

See *Wheats of other classes or varieties (WOOC)*

Darkened kernels (amber durum)

Darkened kernels (amber durum) – Darkened kernels are similar in appearance to penetrated smudge with the exception that discolouration is gray to charcoal in colour rather than red to dark brown.

For grading purposes, darkened kernels should be considered as, and in conjunction with severe midge damage.

Dark immature kernels (DKIM)

Dark immature kernels are also called swath-heated kernels. They are similar to heated kernels, but they do not exhibit the reddish discolouration associated with heated kernels, and they do not have a heated odour.

- Are considered as damage for grading purposes in CWRW

Degermed kernels (DGM)

The germ has been removed through the mechanical handling process or by insect attack. Degermed kernels lack the greyish discolouration that is often present with sprouted kernels.

- Are considered as damage for grading purposes in CWRW. See *Indian Meal Moth*

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease which produces elongated fungus bodies with a purplish black exterior, a purplish white to off-white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Wheat, Held IP Suspect Contaminated Grain.*

Fireburnt kernels (FBNT)

Fireburnt kernels are charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes which crumble easily under pressure.

Foreign material (FM)

Foreign material is anything that is not wheat that remains in the sample after the removal of dockage.

Frost/Heat stress (FRHTS)

Frost/Heat stress refers to wheat kernels with blistered brans as a result of exposure to freezing temperatures or prolonged hot weather conditions. The degree of blistering ranges from fine to coarse and is dependent upon the maturity of the grain, the temperature to which the grain is exposed and the duration of the exposure. Samples containing kernels affected by Frost/Heat stress are graded according to the degree of soundness definition as reflected in the standard or guide samples for each grade.

Fusarium damage (FUS DMG)

Fusarium-damaged wheat is typically characterized by thin or shrunken chalk-like kernels. Fusarium-damaged kernels have a white or pinkish mould or fibrous growth.

Procedures

1. Using a Boerner-type divider, divide the representative portion.
2. Separate all kernels showing any evidence of fusarium damage, including any kernels that have a chalk-like appearance.
3. You may examine kernels using a 10-power magnifying lens to confirm evidence of a white or pinkish mould or fibrous growth. In determining fusarium damage, select only kernels with this white or pinkish mould or fibrous growth.

Grass green kernels (GRASS GR)

Grass-green kernels are a distinct vivid green throughout because of immaturity.

- Are considered as damage for grading purposes in CWRW

Grasshopper, army worm damage (GAW)

Kernels damaged by grasshopper or army worm are chewed, usually on the sides.

- Are considered as damage for grading purposes in CWRW

Green (GR)

Green wheat kernels may range from fully developed to shrunken and distorted with various degrees of darkening that are in contrast to the natural sound colour.
The maturation process has been affected or arrested by the environment or an agronomic practice resulting in a variation in colour, size and shape. The physical effect is dependent on the timing and extent of the exposure to the contributing factors.

Dark immature, *Grass green and Immature* are separate grading factors that should not be confused with *Green* damaged kernels.

Samples containing *Green* kernels are graded according to the degree of soundness definition as reflected in the standard or guide samples for each grade.

Hard vitreous kernels (HVK)

Vitreousness is the natural translucence of a kernel that is a visible sign of kernel hardness. Hard vitreous kernels (HVK) are a grade determinant for the amber durum wheat class in Canada and the red spring wheat class in western Canada.

Red Spring – Western Canada

Note: Cutting of kernels is not permitted

Non-vitreous material includes
- Contrasting classes of wheat
- Foreign material
- Kernels that are sprouted, binburnt, severely mildewed, rotted, mouldy, heated, fireburnt, penetrated smudge, chalky white fusarium damaged, grass green, severely frost damaged or midge damaged
- Whole and pieces of kernels having a defined starch area of at least half the surface area of the kernel or piece of kernel that clearly contrasts with the translucent colour of a vitreous kernels

Amber Durum

Note: Cutting of kernels is permitted

Non-vitreous material includes:
- Wheats of other classes
- Foreign material
- Kernels that are sprouted, binburnt, severely mildewed, rotted, mouldy, heated, fireburnt, penetrated smudge, chalky white fusarium damaged, grass green, severely frost damaged or midge damaged including severe midge damaged
- Kernels having an externally visible starch area of any size
- Kernels having internal starch areas that require cutting of the kernels. Opaque and bleached kernels may require cutting to determine if there are starchy areas within the kernel.
- When evaluating the face of the cross-section, the following will be excluded from non-vitreous:
  - The cut has resulted in a flaking of the endosperm
  - The face of the cross cut kernel has a minute starch area roughly the size of a pencil point typically at the trough of the cheeks
  - The face of the cross cut kernel appears cloudy overall but with no dense white starch area

Procedures

1. Using a Boerner-type divider, divide a representative portion of 250 g from the cleaned sample.
2. Sieve the representative portion mechanically, using the Carter dockage tester or manually using the No. 4.5 slotted sieve.

Feed control	#6
Air control	Off
Riddle	None
Top sieve	No. 4.5 slotted sieve
Centre sieve	Blank tray
Bottom sieve	None
Sieve cleaner	Off

Manual method

Sift the approximately 250 g clean sub-sample over the No. 4.5 slotted hand sieve. Sifting shall consist of 25 complete motions of about 15 cm total distance.

3. From the material that remains on top of the sieve or lodged in the sieve, divide a portion of 15 g, or 25 g for export shipments.

   Material that passes through the sieve is not used in the determination of HVK.
4. Separate vitreous and non-vitreous kernels from the 15-g portion.
5. For amber durum only: Cut and examine the endosperm of suspect kernels to determine if they are vitreous.

Heated kernels (HTD)

Heated kernels have the colour and may have the odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. They range from orange-red to very dark brown, but are not black.

Heated seeds of other grains are included in the tolerance for *Heated.*

Immature (IM)

Immature wheat kernels are not fully ripened. The kernels may be fully developed with various shades of green that are in contrast to the natural sound colour.

The kernel development has been arrested during the maturation process often resulting in variation in colour, size and shape.

Dark immature and *Grass green* are separate grading factors that should not be confused with *Immature* kernels.

Samples containing *Immature* kernels are graded according to the degree of soundness definition as reflected in the standard or guide samples for each grade.

Indian meal moth (DGM)

Consider kernels showing damage from Indian meal moth as degermed.
See *Degermed.*

- Are considered as damage for grading purposes in CWRW

Matter other than cereal grains (MOTCG)

Matter other than cereal grains is

- Inseparable seeds such as ragweed, Tartary buckwheat, rye grass, and wild oats
- Non-cereal domestic grains such as flaxseed, corn, peas, buckwheat and lentils that remain in the cleaned sample

Midge damage (MDGE DMG)

For grading purposes, midge damaged kernels must have at least two of the following characteristics;

- A rupture of the bran on either the back or side of the kernel
- A distinct white line or mark, located on the back or side of the kernel
- The kernel is distinctly distorted

Mildew (MIL)

Mildew kernels are kernels affected by field fungi that develop under conditions of excessive moisture affecting unthreshed kernels of wheat. Samples affected by mildew have an overall greyish discolouration with grey to black mildew spores typically attached to the brush end of the kernel.
Samples containing kernels affected by mildew are graded according to the degree of soundness definition as reflected in the standard or guide samples for each grade.

See *Severely mildewed* for heavily affected samples

Note: Samples of Canadian Eastern Hard Red Winter (CEHRW) and Canadian Eastern Soft Red Winter (CESRW) will be graded no lower than No. 3 CE account mildew.

Mouldy kernels (MLDY KRNL)

Mouldy kernels are discoloured, swollen and soft as a result of decomposition by fungi or bacteria. They have mould visible to the naked eye and may feel spongy under pressure.

There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.

Procedures

- Determine the weight of mouldy kernels as a percentage of the net weight of the sample.

Natural stain (NSTN)

Naturally stained kernels are caused by contact with natural substances such as bunt spores, soil or weeds. Kernels that are lightly stained should not be considered.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour—such as fuel oil, skunk or urea
- The presence of visible residue causing the odour

If odour is the grade determinant and there is...	Then the grade is...
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Wheat, Sample CW/CE/CAN Account Odour*
A distinct heated odour	*Wheat, Sample CW/CE/CAN Account Heated*
A distinct fireburnt odour	*Wheat, Sample CW/CE/CAN Account Fireburnt*

Other cereal grains (OCG)

Other cereal grains in wheat are rye, barley, triticale, oats, oat groats, and wild oat groats that remain in the cleaned sample. Other cereal grains are treated as total foreign material.

For grading purposes, spelt and Kamut® are considered as *Other cereal grains* in samples of wheat.

Other cereal grains and other matter (OCGOM)

Other cereal grains and other matter in the export grade determinant tables refers to cereal grains other than wheat and inseparable material excluding large seeds, wild oats, stones, mineral matter, ergot and *sclerotinia sclerotiorum.*

Penetrated smudge (PENT SM)

With penetrated smudge, the discolouration penetrates and extends throughout the endosperm, usually as a result of a more severe infection.

Procedures

Note: Cutting of kernels is permitted

- Determine the weight of penetrated smudge kernels as a percentage of the net weight of the sample.

Pink kernels (PNK)

Pink pigment in wheat kernels is an indication of immaturity. Pink kernels

- Are shrunken
- Display a pink discolouration
- Are considered as damage for grading purposes in CWRW

▲ **Important:** Do not confuse pink kernels with fusarium-damaged kernels, pesticide treated seed or other contaminated grains.

Protein (PROT)

The classes of CWRS, CWHWS, CWAD, CWES and CWRW wheat have minimum protein levels established for No. 1 grades. Protein content is reported on a 13.5% moisture basis.

See *Primary grade determinants tables.*

Rotted kernels (ROT KRNL)

Rotted kernels are discoloured, swollen and soft as a result of decomposition by fungi or bacteria. They may feel spongy under pressure.

There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.

Procedures

- Determine the weight of rotted kernels as a percentage of the net weight of the sample.

Ruptured kernels

Kernels are considered to be ruptured when the split in the cheek extends at least half the length of the cheek or if both cheeks are split to any degree. Ruptured kernels do not require magnification to be identified.
For tolerances refer to *Ruptured kernel tolerance* memo.

Note: The grades of Wheat, No. 1 CWRS and Wheat No. 1 CWHWS have numerical tolerances. For all other grades of wheat, ruptured kernels are considered as severely damaged and are assessed using the "Degree of Soundness" definition of the grading table.

Sawfly damage (SFLY DMG)

Kernels with sawfly damage are shrivelled or distorted.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Severely midge damaged kernels (SEVMDGE)

Midge damaged kernels that have a blackened streak extending more than one quarter the length of the kernel are classed as severely midge damaged kernels. This discolouration is the result of a fungal infection. Midge damaged kernels that are blackened less than one quarter the length of the kernel or only grey discolouration of any amount, are not assessed as severely midge damaged kernels. Severe midge damage is determined for CWAD only.

Severely mildewed kernels (SEVMIL)

In severely mildewed wheat, mildew spores have severely blackened the kernel inside and out. The kernels may feel spongy under pressure.

There is a single tolerance for the total of binburnt, severely mildewed, mouldy, and rotted kernels.

Procedures

- Determine the weight of severely mildewed kernels as a percentage of the net weight of the sample.

Severely sprouted kernels (SEVSPTD)

Kernels are assessed as severely sprouted when

- The sprout extends beyond the normal contour of the germ
- The kernels are severely degenerated as an apparent result of advanced sprouting
- The sprout has been clearly broken and only a portion remains
- The sprout is completely gone and there is evidence showing that there was extension of the sprout outside the normal contour of the germ

Note: for midge damaged amber durum kernels, use following table:

Midge damaged amber durum kernels with a	Considered as
broken rootlet within the contour of the germ	Sprouted
broken rootlet extending beyond the contour of the germ	Severely sprouted

Shrunken and broken (SHR, BKN)

Percentages of shrunken and broken kernels are determined from the same representative portion.

Shrunken kernels (SHR)

Shrunken kernels are whole kernels of wheat that pass through a No. 4.5 slotted sieve.

Broken kernels (BKN)

Broken kernels are pieces of wheat that are less than three-quarters of a whole kernel. If the piece is more than three-quarters of a kernel, it is considered whole.

Representative portion for analysis

Minimum—250 g	Optimum—250 g	Export—250 g

Determine the percentage of shrunken kernels

1. Using a Boerner-type divider, divide a representative portion of approximately 250 g from the sample.
2. Pass the portion through the Carter dockage tester set up as follows:

Feed control	#5
Air control	Off
Riddle	None
Top sieve	No. 4.5 slotted
Centre sieve	Blank tray
Bottom sieve	None
Sieve cleaner	Off

3. Separate the shrunken and broken kernels which pass through the sieve and calculate a percentage for each.

Determine the percentage of broken kernels

4. Using a Boerner-type divider and the sieved portion from Step 2, divide a representative portion of approximately 50 g.
5. Handpick broken kernels from the 50-g portion and calculate the percentage.
6. Add this percentage to the percentage of handpicked kernels from Step 3 to determine Total Broken.

Report total shrunken and broken (TSHRBKN)

7. When the percentage of shrunken, broken or total shrunken and broken is the grade determinant and is over the grade tolerance by up to 0.9% the excess fraction up to 0.9% is truncated for grade determination, for example, 4.6% is considered 4.0%. However, the percentages of shrunken, broken and total shrunken and broken recorded in documentation is the actual non-truncated percentages. The percentages of total shrunken and broken subject to truncation is the sum of the actual non-truncated percentages of shrunken kernels and of broken kernels.

Examples
1 CWRS tolerances: shrunken 4%; broken 5%; total shrunken and broken 7%

Example 1
A 1 CWRS with; shrunken 4.7%, broken 2.2%; total shrunken and broken 6.9%

Shrunken would be reported as 4.7% but would be considered to be 4% for grade determination, total shrunken and broken would be reported as 6.9%. The sample would grade 1 CWRS.

Example 2
A 1 CWRS with; shrunken 4.7%, broken 3.2%, total shrunken and broken 7.9%.

Shrunken would be reported as 4.7% but would be considered to be 4% for grade determination. Total shrunken and broken would be reported as 7.9% but would be considered to be 7% for grade determination. The sample would grade 1 CWRS.

Example 3
A 1CWRS with; shrunken 4.7%, broken 3.4% and total shrunken and broken 8.1%.

Total shrunken and broken would be reported as 8.1% and could not be truncated in the determination of grade because it exceeds the tolerance by more than 0.9%. Shrunken would be reported as 4.7% but would be considered to be 4% for grade determination since truncation would improve the grade from a CWFD to 2 CWRS. The sample would grade 2 CWRS for 8.1% Total Shrunken and Broken.

Smudge (SM)

Smudge is a discolouration on the kernel as a result of infection by some common field fungi. The discolouration may be brown, black or red.

Amber durum

The discolouration is assessed as smudge in amber durum if:

1. More than one-half the kernel is discoloured, or
2. Discolouration of the crease
    - Has spread onto the cheeks of the kernel regardless of any discolouration of the germ
    - Appears as a thin line extending more than half the length of the crease, in combination with any discolouration of the germ.

Note: kernels that have a thin line of discolouration of any length in the crease, but have no discolouration of the germ, are not assessed as smudge.

Classes of wheat other than amber durum

The discolouration is considered as smudge in wheat classes other than amber durum if more than one-half of the kernel is discoloured, or if the discolouration extends into the crease. Less extensive discolouration is considered blackpoint.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only— if they do not crumble, they are considered *Stones.*
- Any non-toxic material of similar consistency.

Procedures

1. Handpick soft earth pellets from the clean sample.
2. Soft earth pellets constituting 10% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Wheat, Sample Account Admixture.*

Sprouted kernels (SPTD)

Kernels are sprouted if one of the following conditions exists:

- Kernels show clear evidence of growth in the germ area including kernels where the bran is noticeably split over the germ area along with clear evidence of growth.
- The germ is missing along with discolouration and deterioration of the kernel from weathering.

Note: Kernels with missing germs that are not discoloured and deteriorated from weathering see *Degermed*

Note: for midge damaged amber durum kernels, use following table:

Midge damaged amber durum kernels with a	Considered as
broken rootlet within the contour of the germ	Sprouted
broken rootlet extending beyond the contour of the germ	Severely sprouted

Procedures

1. Using a Boerner-type divider, divide a representative portion.
2. Separate all kernels showing any evidence of sprouting.

▲ **Important:** For CEWW, unless there is clear evidence of growth, do not count the kernel as sprouted.

3. You may use a 10-power magnifying lens to confirm sprouting activity.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non-toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the material removed is 5% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Wheat, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Wheat, Sample Canada Eastern Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Wheat, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Wheat, Canada Western Red Spring

Grade name	Stones %
No. 1 CWRS	0.03
No. 2 CWRS	0.03
No. 3 CWRS	0.06
CW Feed	0.10

Basic grade:......................... *Wheat, No. 3 CWRS*

Reason for basic grade:....... Mildew

If the above sample contained	Grade in Western Canada
0.08% stones	*Wheat, Rejected No. 3 CWRS Account Stones*
1.0% stones	*Wheat, Rejected No. 3 CWRS Account Stones*
3.0% stones	*Wheat, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Wheat, Canada Eastern Red Spring

Grade name	Stones %
No. 1 CERS	0.03
No. 2 CERS	0.03
No. 3 CERS	0.06
CE Feed	0.10

Basic grade:......................... *Wheat, No. 3 CERS*

Reason for basic grade:....... Mildew

If the above sample contained	Grade in Eastern Canada
0.08% stones	*Wheat, CE Feed*
1.0% stones	*Wheat, Sample CE Account Stones*
3.0% stones	*Wheat, Sample Salvage*

Streak mould

Kernels with unusual dark grey streaks on their sides toward the brush may indicate streak mould. This very slow-growing mould is harmless in wheat, but it affects kernel appearance. It occurs most commonly in red winter wheat. It is not related to the more serious storage moulds.

Procedures

For grading, include streak mould with blackpoint.

Superficial discolouration (SUPDISCLR)

Superficial discolouration is a reddish discolouration not penetrating the endosperm. This factor is evaluated subjectively in relation to the degree of soundness without reference to specific tolerances.

Total Damage (TDMG)

Includes kernels that are dark immature, degermed, fireburnt, fusarium damaged, grass green, grasshopper/army worm damaged, heated, pink, sawfly/midge damaged, smudge damaged, sprouted or damaged in any other way.

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Wheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Wheats of other classes or varieties (WOOC)

- Other classes of wheat are all classes of wheat, including non-registered varieties, other than the predominant class in the sample.

  Contrasting classes are classes of different colour wheat; for example, CWAD is a contrasting class in CWRS.

  Note: The wheat class CWHWS is considered a WOOC for grading purposes in samples of CWRS.
- Other varieties of wheat are any registered varieties.

Working tolerance for wheats of other classes that blend

When assessing wheats of other classes that blend, up to 0.9% in excess of the grade specification is considered a working tolerance and disregarded.
For example, for No. 2 CWRS the tolerance is 4.5%. Samples containing up to 5.4% will still be considered within tolerance.

Note: This working tolerance only applies to registered varieties that qualify for the milling grades of wheat.

Predominant class	**Wheats of other classes**															
	CWRS	**CWHWS**	**CWAD**	**CWRW**	**CWSWS**	**CWES**	**CWSP**	**CPSW**	**CPSR**	**CNHR**	**CER[1]**	**CEAD**	**CEWW**	**CESWS**	**CEHWS**	**CEHWW**
CWRS	–	WOOC	CC	WOOC *	CC	WOOC *	**	CC	WOOC *	WOOC*	WOOC *	CC	CC	CC	CC	CC
CWHWS	CC	–	CC	CC	WOOC	CC	**	WOOC	CC	CC	CC	CC	WOOC	WOOC	–	WOOC
CWAD	WOOC	WOOC	–	WOOC	WOOC	WOOC	**	WOOC	WOOC	WOOC	WOOC	–	WOOC	WOOC	WOOC	WOOC
CWRW	WOOC *	CC	CC	–	CC	WOOC *	**	CC	WOOC *	WOOC*	WOOC *	CC	CC	CC	CC	CC
CWSWS	WOOC	WOOC	WOOC	WOOC	–	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	–	WOOC	WOOC
CWES	WOOC *	CC	CC	WOOC *	CC	–	**	CC	WOOC *	WOOC*	WOOC *	CC	CC	CC	CC	CC
CWSP	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	-	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC
CPSW	CC	WOOC	CC	CC	WOOC	CC	**	–	CC	CC	CC	CC	WOOC	WOOC	WOOC	WOOC
CPSR	WOOC *	CC	CC	WOOC *	CC	WOOC *	**	CC	–	WOOC*	WOOC *	CC	CC	CC	CC	CC
CNHR	WOOC*	WOOC	CC	WOOC*	CC	WOOC*	**	CC	WOOC*	–	WOOC*	CC	CC	CC	CC	CC
CER[1]	–	CC	CC	–	CC	–	***	CC	–	–	–	CC	CC	CC	CC	CC
CERS	–	WOOC	CC	–	CC	–	***	CC	–	–	–	CC	CC	CC	WOOC	CC
CEHRW	–	CC	CC	–	CC	–	***	CC	–	–	–	CC	CC	CC	CC	CC
CESRW	–	CC	CC	–	CC	–	***	CC	–	–	–	CC	CC	CC	CC	CC
CEAD	WOOC	WOOC	-	WOOC	WOOC	WOOC	**	WOOC	WOOC	WOOC	WOOC	–	WOOC	WOOC	WOOC	WOOC
CEWW	CC	WOOC	CC	CC	WOOC	CC	**	WOOC	CC	CC	CC	CC	–	WOOC	WOOC	WOOC
CESWS	WOOC	WOOC	WOOC	WOOC	–	WOOC	**	WOOC	WOOC	WOOC	WOOC	WOOC	WOOC	–	WOOC	WOOC
CEHWS	CC	–	CC	CC	WOOC	CC	***	WOOC	CC	CC	CC	CC	WOOC	WOOC	–	WOOC
CEHWW	CC	WOOC	CC	CC	WOOC	CC	***	WOOC	CC	CC	CC	CC	WOOC	WOOC	WOOC	-

	WOOC	Wheats of other classes
	CC	Contrasting classes
(*)	See Working tolerance for wheats of other classes that blend	
(**)	Consider as WOOC if the same colour, consider as CC if a different colour	
(***)	No WOOC tolerance, consider as CC if a different colour	

Note: [1] CER is used for CERS, CEHRW and CESRW

Primary grade determinants tables

Wheat, Canada Western Red Spring (CWRS)

	Standard of quality					Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	Variety	**Minimum hard vitreous kernels %**	**Minimum protein %**	Degree of soundness	Ergot %	Excreta %	**Matter other than cereal grains %**	Sclerotinia %	Stones %	Total %
No.1 CWRS	75 (365)	Any variety of the class CWRS designated as such by order of the Commission	65	10	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	0.6
No. 2 CWRS	72 (350)	Any variety of the class CWRS designated as such by order of the Commission	No minimum	No minimum	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.04	0.010	0.3	0.04	0.03	1.2
No. 3 CWRS	69 (335)	Any variety of the class CWRS designated as such by order of the Commission	No minimum	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	2.4
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	No minimum	No minimum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.030	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*					*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less–*Wheat, Rejected grade, Account Stones* Over 2.5%–*Wheat, Sample Salvage*	See *Mixed grain*

Wheat Canada Western Red Spring (CWRS), continued

Grade name	Wheats of other classes or varieties (*)		Artificial stain, no residue %	Dark, Immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No.1 CWRS	0.75	2.3	Nil	1	4	Nil	0.25	0.75	1	0.005	0.05
No. 2 CWRS	2.3	4.5	0.05	2.5	7	Nil	0.8	2	3	0.020	0.4
No. 3 CWRS	3.8	7.5	0.10	10	13	Nil	1.5	10	6	0.030	1.0
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	No limit	2.5	2.5
Grade, if specs for CW Feed not met	Over 10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP – Wheat, *Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*			*Wheat, Sample CW Account Fireburnt*	*Wheat, Sample CW Account Fusarium Damage Over 10%- Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*	

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint		Sprouted	
				Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No.1 CWRS	0.5	1.5	2.0	4	5	7	0.30	10	0.10	0.5
No. 2 CWRS	2	5	5	4	6	8	1	20	0.20	1.0
No. 3 CWRS	5	10	10	4	7	9	5	35	0.30	3.0
CW Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CW Feed not met					*Sample Broken Grain*					

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Hard White Spring (CWHWS)

	Standard of quality				Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum protein %**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No.1 CWHWS	75 (365)	Any variety of the class CWHWS designated as such by order of the Commission	10	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	0.6
No. 2 CWHWS	75 (365)	Any variety of the class CWHWS designated as such by order of the Commission	No minimum	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.04	0.010	0.3	0.04	0.03	1.2
No. 3 CWHWS	72 (350)	Any variety of the class CWHWS designated as such by order of the Commission	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	2.4
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	No minimum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.030	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*				*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less–*Wheat, Rejected grade, Account Stones* Over 2.5%–*Wheat, Sample Salvage*	See *Mixed grain*

Wheat Canada Western Hard White Spring (CWHWS), continued

Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Dark, immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No.1 CWHWS	3.0	3	Nil	1	4	Nil	0.25	0.75	1	0.005	0.05
No. 2 CWHWS	3.0	3	0.05	2.5	7	Nil	0.8	2	3	0.020	0.4
No. 3 CWHWS	5.0	5	0.10	10	13	Nil	1.5	10	6	0.030	1.0
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	No limit	2.5	2.5
Grade, if specs for CW Feed not met	Over 10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP – Wheat, *Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*			*Wheat, Sample CW Account Fireburnt*	*Wheat, Sample CW Account Fusarium Damage Over 10%- Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*	

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint		Sprouted	
				Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No.1 CWHWS	0.5	1.5	2.0	4	5	7	0.30	10	0.10	0.5
No. 2 CWHWS	2	5	5	4	6	8	1	20	0.20	1.0
No. 3 CWHWS	5	10	10	4	7	9	5	35	0.30	3.0
CW Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CW Feed not met					*Sample Broken Grain*					

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Amber Durum (CWAD)

	Standard of quality					Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum hard vitreous kernels %**	**Minimum protein %**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CWAD	79 (387)	Any variety of the class CWAD designated as such by order of the Commission	80	9.5	Reasonably well matured, reasonably free from damaged kernels	0.02	0.010	0.2	0.02	0.03	0.5
No. 2 CWAD	77 (377)	Any variety of the class CWAD designated as such by order of the Commission	60	No minimum	Reasonably well matured, reasonably free from severely damaged kernels	0.02	0.010	0.3	0.02	0.03	1.2
No. 3 CWAD	74 (362)	Any variety of the class CWAD designated as such by order of the Commission	40	No minimum	Fairly well matured, may be moderately weather-damaged or frost-damaged, reasonably free from severely damaged kernels	0.04	0.010	0.5	0.04	0.06	1.5
No. 4 CWAD	71 (347)	Any variety of the class CWAD designated as such by order of the Commission	No minimum	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.010	0.5	0.04	0.06	3.0
No. 5 CWAD	65 (318)	Any variety of amber durum wheat	No minimum	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.030	1	0.1	0.1	10
Grade, if No. 5 specs not met	*Wheat, Sample CW Account Light Weight*					*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less– *Rejected (grade), Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Western Amber Durum (CWAD), continued

	Wheats of other classes or varieties								Heated	
Grade name	Other classes %	Total %	Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CWAD	2.0	4	Nil	4	Nil	0.5	0.75	1	0.005	0.05
No. 2 CWAD	3.0	7.5	0.03	7	Nil	0.5	2	3	0.010	0.1
No. 3 CWAD	4.3	11	0.07	10	Nil	2.0	4	5	0.020	0.4
No. 4 CWAD	10	49	0.12	13	Nil	2.0	10	8	0.5	1.5
No. 5 CWAD	49	No limit	2	No limit	2	4	No limit	No limit	5	5
Grade, if No. 5 specs not met	*Wheat, Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*		*Wheat, Sample CW Account Fireburnt*	*Wheat, Sample CW Account Fusarium Damage* *Over 10%- Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*	

					Shrunken and broken (**)			Smudge and blackpoint			Sprouted	
								Smudge				
Grade name	Natural stain %	Pink %	Severe midge %	Sawfly, midge %	Shrunken %	Broken %	Total %	Penetrated smudge %	Total %	Total %	Severely sprouted %	Total %
No. 1 CWAD	0.5	3	0.1	2.0	3	6	7	0.03	0.50	5	0.20	0.5
No. 2 CWAD	2	6	0.25	8	3	8	9	0.25	1	10	0.40	2
No. 3 CWAD	5	10	0.75	15	3	10	11	0.5	3	20	3.0	7
No. 4 CWAD	7.5	No limit	2	40	3	11	12	Consider overall appearance			12	12
No. 5 CWAD	No limit	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit			No limit	No limit
Grade, if No. 5 specs not met						*Sample Broken Grain*						

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Red Winter (CWRW)

	Standard of quality				Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum protein %**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CWRW	79 (386)	Any variety of the class CWRW designated as such by order of the Commission	11	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	0.4
No. 2 CWRW	76.5 (373)	Any variety of the class CWRW designated as such by order of the Commission	11	Fairly well matured, may be moderately frost damaged, reasonable free from severely damaged kernels	0.04	0.015	0.3	0.04	0.06	0.7
No. 3 CWRW	74 (360)	Any variety of the class CWRW designated as such by order of the Commission	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	1.3
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.030	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*				*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less– *Rejected (grade) Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Western Red Winter (CWRW), continued

	Wheats of other classes or varieties (*)					Maximum damage limits				
									Heated	
Grade name	**Contrasting classes %**	**Total %**	**Artificial stain, no residue %**	**Natural Stain %**	**Blackpoint %**	**Fireburnt %**	**Fusarium damage %**	**Sawfly, midge %**	**Binburnt severely mildewed rotted, mouldy %**	**Total %**
No. 1 CWRW	1.0	3	Nil	0.5	10	Nil	0.8	1.0	0.005	0.05
No. 2 CWRW	2	5	0.07	2	20	Nil	1.0	5	0.010	0.1
No. 3 CWRW	3	10	0.1	5	35	Nil	1.5	7	0.030	0.5
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	2.5	2.5
Grade, if specs for CW Feed not met	Over 10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP – Wheat, *Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*			*Wheat, Sample CW Account Fireburnt*	*Wheat, Sample CW Account Fusarium Damage* Over 10% - *Wheat, Commercial Salvage*		*Wheat, Sample CW Account Heated*	

	Maximum damage limits (continued)					Shrunken and broken (**)		
	Smudge		Sprouted					
Grade name	**Penetrated smudge %**	**Total %**	**Severely sprouted %**	**Total %**	**Total damage %**	**Shrunken %**	**Broken %**	**Total %**
No. 1 CWRW	0.03	0.30	0.10	0.5	2	3	3	3
No. 2 CWRW	1.0	3	0.20	1.0	5	3	5	5
No. 3 CWRW	3	5	0.30	2.5	7	3	8	8
CW Feed	No limit	No limit	No limit	No limit	N/A	No limit	13	No limit within broken tolerances
Grade, if specs for CW Feed not met							*Sample Broken Grain*	

(*) See working tolerance for "Wheats of Other Classes or Varieties" (**) See truncation rule for "Shrunken and Broken"
Note: the specification columns for dark immature, grass green, degermed, pink kernels and grasshopper damage have been removed. Kernels found in a sample exhibiting these characteristics are assessed in the "Total Damage" specification.

Wheat, Canada Western Soft White Spring (CWSWS)

Grade name	Standard of quality			Foreign material					
	Minimum test weight kg/hL (g/0.5 L)	Variety	Degree of soundness	Ergot %	Excreta %	Matter other than cereal grains %	Sclerotinia %	Stones %	Total %
No. 1 CWSWS	76 (370)	Any variety of the class CWSWS designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	1.0
No. 2 CWSWS	74 (360)	Any variety of the class CWSWS designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.04	0.010	0.3	0.04	0.03	2.0
No. 3 CWSWS	69 (335)	Any variety of the class CWSWS designated as such by order of the Commission	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.0
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.030	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*			*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less– *Rejected (grade) Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Western Soft White Spring (CWSWS), continued

Grade name	Wheats of other classes or varieties %	Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
								Binburnt, severely mildewed rotted, mouldy %	Total %
No. 1 CWSWS	3	Nil	4	Nil	1.5	**0.75**	1	0.005	0.05
No. 2 CWSWS	6	0.03	7	Nil	1.5	2	3	0.010	0.1
No. 3 CWSWS	10	0.07	10	Nil	1.5	4	5	0.020	0.4
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP	2	No limit	2	4	No limit	No limit	2.5	2.5
Grade, if specs for CW Feed not met	Over 10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP – Wheat, *Sample CW Account Admixture*	*Wheat, Sample CW Account Stained Kernels*		*Wheat, Sample CW Account Fireburnt*	10% or less–*Wheat, Sample CW Account Fusarium Damage* Over 10%– *Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*	

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint			Sprouted	
							Smudge				
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total %	Total %	Severely sprouted %	Total %
No. 1 CWSWS	0.5	3	2.0	3	5	7	0.03	0.30	10	0.10	1
No. 2 CWSWS	2	6	8	3	6	8	0.5	1	15	0.30	5
No. 3 CWSWS	5	10	15	3	7	9	1.0	3	35	0.50	8
CW Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit	No limit
Grade, if specs for CW Feed not met					*Sample Broken Grain*						

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Extra Strong (CWES)

	Standard of quality				Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum protein %**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CWES	75 (365)	Any variety of the class CWES designated as such by order of the Commission	10	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.04	0.010	0.2	0.04	0.03	**0.75**
No. 2 CWES	73 (355)	Any variety of the class CWES designated as such by order of the Commission	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.030	0.3	0.04	0.06	1.5
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.030	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*				*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less– *Rejected(grade) Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Western Extra Strong (CWES), continued

Grade name	Wheats of other classes or varieties (*)		Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %							Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CWES	1.5	3	0.05	7	Nil	1.0	2	3	0.020	0.4
No. 2 CWES	2.5	5	0.10	13	Nil	1.0	10	8	0.030	1.0
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	2	4	No limit	No limit	2.5	2.5
Grade, if CW Feed specs not met	Over 10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP – Wheat, *Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*		*Wheat, Sample CW Account Fireburnt*	*10% or less–Wheat, Sample CW Account Fusarium Damage* Over 10%– *Wheat Commercial Salvage*			*Wheat, Sample CW Account Heated*	

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint		Sprouted	
				Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No. 1 CWES	2	5	2.0	3	7	8	1	15	0.10	0.5
No. 2 CWES	5	10	5	3	7	8	Consider overall appearance		0.30	2
CW Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit		No limit	No limit
Grade, if CW Feed specs not met					*Sample Broken Grain*					

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Prairie Spring White (CPSW)

Grade name	Standard of quality			Foreign material					
	Minimum test weight kg/hL (g/0.5 L)	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CPSW	77 (375)	Any variety of the class CPSW designated as such by order of the Commission	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.04	0.010	0.2	0.04	0.03	0.75
No. 2 CPSW	75 (365)	Any variety of the class CPSW designated as such by order of the Commission	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.030	0.3	0.04	0.03	1.5
CW/CE Feed	65 (315)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.030	1	0.1	0.1	10
Grade, if specs for CW/CE Feed not met	*Wheat, Sample CW Account Light Weight*			*Wheat, Sample Canada Account Ergot*	*Wheat, Sample Canada Account Excreta*	*Wheat, Sample Canada Account Admixture*	*Wheat, Sample Canada Account Admixture*	2.5% or less– *Rejected (grade) Account Stones* or *Wheat, Sample Canada Account Stones* Over 2.5% – *Wheat, Sample Salvage*	See *Mixed grain*

Canada Prairie Spring White (CPSW) continued

Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CPSW	3	5	0.05	2.5	7	Nil	1.5	2	3	0.020	0.4
No. 2 CPSW	5	10	0.10	10	13	Nil	1.5	10	8	0.030	1.0
CW/CE Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	No limit	2.5	2.5
Grade, if specs for CW/CE Feed not met	Over 10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP – Wheat, *Sample CW Account Admixture*		*Wheat, Sample Canada Account Stained Kernels*			*Wheat, Sample Canada Account Fireburnt*	10% or less–*Wheat, Sample Canada Account Fusarium Damage* Over 10%– *Wheat, Commercial Salvage*			*Wheat, Sample Canada Account Heated*	

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint			Sprouted	
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	Severely sprouted %	Total %
No. 1 CPSW	2	5	3	5	6	9	0.10	1	20	0.10	0.5
No. 2 CPSW	5	10	8	5	6	9	0.5	5	35	0.30	2
CW/CE Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit	No limit
Grade, if specs for CW/CE Feed not met					*Sample Broken Grain*						

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Prairie Spring Red (CPSR)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CPSR	77 (375)	Any variety of the class CPSR designated as such by order of the Commission	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.04	0.010	0.2	0.04	0.03	**0.75**
No. 2 CPSR	75 (365)	Any variety of the class CPSR designated as such by order of the Commission	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.030	0.3	0.04	0.03	1.5
CW/CE Feed	65 (315)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.030	1	0.1	0.1	10
Grade, if specs for CW/CE Feed not met	*Wheat, Sample Canada, Account Light Weight*			*Wheat, Sample Canada Account Ergot*	*Wheat, Sample Canada Account Excreta*	*Wheat Sample Canada Account Admixture*	*Wheat, Sample Canada Account Admixture*	2.5% or less– *Rejected (grade) Account Stones* or *Wheat, Sample Canada Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed Grain*

Wheat, Canada Prairie Spring Red (CPSR), continued

	Wheats of other classes or varieties (*)									Heated	
Grade name	**Contrasting classes %**	**Total %**	**Artificial stain, no residue %**	**Dark immature %**	**Degermed %**	**Fireburnt %**	**Fusarium damage %**	**Grass green %**	**Grasshopper %**	**Binburnt severely mildewed rotted, mouldy %**	**Total %**
No. 1 CPSR	3	5	0.05	2.5	7	Nil	1.5	2	3	0.020	0.4
No. 2 CPSR	5	10	0.10	10	13	Nil	1.5	10	8	0.030	1.0
CW/CE Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	No limit	2.5	2.5
Grade, if specs for CW/CE Feed not met	Over 10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP – Wheat, *Sample CW Account Admixture*		*Wheat, Sample Canada Account Stained Kernels*			*Wheat, Sample Canada Account Fireburnt*	10% or less–*Wheat, Sample Canada Account Fusarium Damage* Over 10%– *Wheat, Commercial Salvage*			*Wheat, Sample Canada Account Heated*	

				Shrunken and broken (**)			Smudge and blackpoint			Sprouted	
							Smudge				
Grade name	**Natural stain %**	**Pink %**	**Sawfly, midge %**	**Shrunken %**	**Broken %**	**Total %**	**Penetrated smudge %**	**Total %**	**Total %**	**Severely sprouted %**	**Total %**
No. 1 CPSR	2	5	3	5	6	9	0.10	1	20	0.10	0.5
No. 2 CPSR	5	10	8	5	6	9	0.5	5	35	0.30	2
CW/CE Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit	No limit
Grade, if specs for CW/CE Feed not met					*Sample Broken Grain*						

(*) See working tolerance for "Wheats of Other Classes or Varieties"

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Northern Hard Red (CNHR)

Grade name	Standard of quality				Foreign material					
	Minimum test weight kg/hl (g/0.5 L)	Variety	**Minimum Protein %**	**Degree of soundness**	Ergot %	Excreta %	**Matter other than cereal grains %**	Sclerotinia %	Stones %	Total %
No.1 CNHR	75 (365)	Any variety of the class CNHR designated as such by order of the Commission	11	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	0.6
No. 2 CNHR	72 (350)	Any variety of the class CNHR designated as such by order of the Commission		Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	0.04	0.010	0.3	0.04	0.03	1.2
No. 3 CNHR	69 (335)	Any variety of the class CNHR designated as such by order of the Commission		May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	2.4
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP		Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.030	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*				*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less–*Wheat, Rejected grade, Account Stones* Over 2.5%–*Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Northern Hard Red (CNHR) continued

Grade name	Wheats of other classes or varieties (*)		Artificial stain, no residue %	Dark, immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No.1 CNHR	1.0	3	Nil	1	4	Nil	0.25	0.75	1	0.005	0.05
No. 2 CNHR	3	5	0.05	2.5	7	Nil	0.8	2	3	0.020	0.4
No. 3 CNHR	5	10	0.10	10	13	Nil	1.5	10	6	0.030	1.0
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	No limit	2.5	2.5
Grade, if specs for CW Feed not met	Over 10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP – Wheat, *Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*			*Wheat, Sample CW Account Fireburnt*	*Wheat, Sample CW Account Fusarium Damage Over 10%- Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*	

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint		Sprouted	
				Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No.1 CNHR	0.5	1.5	2.0	4	5	7	0.30	10	0.10	0.5
No. 2 CNHR	2	5	5	4	6	8	1	20	0.20	1.0
No. 3 CNHR	5	10	10	4	7	9	5	35	0.30	3.0
CW Feed	No limit	No limit	No limit	No limit	13	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CW Feed not met					*Sample Broken Grain*					

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Special Purpose (CWSP)

	Standard of quality				Maximum limits of			
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Heated %**	**Fusarium %**	**Ergot %**	**Excreta %**	**Stones %**	**Total Foreign Material %**
No. 1 CWSP	72 (350)	Any variety of the class CWSP designated as such by order of the Commission	2.5	1.0	0.1	0.030	0.03	5
No. 2 CWSP	65 (315)	Any variety of the class CWSP designated as such by order of the Commission	2.5	4	0.1	0.030	0.06	10
Grade, if No. 2 specs not met	*Wheat, Sample CW Account Light Weight*		*Wheat, Sample CW Account Heated*	10% or less–*Wheat, Sample CW Account Fusarium Damage* Over 10%– *Wheat, Commercial Salvage*	*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	2.5% or less–*Rejected(grade) Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See Mixed grain

Grade name	**Artificial stain, no residue %**	**Fireburnt %**	**Broken %**
No. 1 CWSP	2	2	13
No. 2 CWSP	2	2	50
Grade, if No. 2 specs not met	*Wheat, Sample CW Account Stained Kernels*	*Wheat, Sample CW Account Fireburnt*	*Sample Broken Grain*

Wheat, Canada Eastern Red (CER)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CER	75 (365)	Any registered variety of red wheat excluding Feed class	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	**0.75**
No. 2 CER	72 (360)	Any registered variety of red wheat excluding Feed class	Fairly well matured, reasonably free from severely damaged kernels	0.04	0.015	0.3	0.04	0.03	1.5
No. 3 CER	69 (335)	Any registered variety of red wheat excluding Feed class	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.5
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.030	1	**0.25**	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Red (CER), continued

									Heated	
Grade name	Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CER	1.0	Nil	1	4	Nil	1.0	0.75	1	0.020	0.1
No. 2 CER	3	0.03	2.5	7	Nil	1.0	2	3	0.050	0.75
No. 3 CER	5	0.07	10	10	Nil	1.5	4	5	0.10	2.0
CE Feed	No limit–but not more than 10% amber durum	2	No limit	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*			*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

				Shrunken and broken (**)			Smudge and blackpoint			
							Smudge			
Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken %	Broken %	Total %	Penetrated smudge %	Total %	Total %	Sprouted %
No. 1 CER	0.5	1.5	2.0	6	6	7	0.03	0.30	10	0.5
No. 2 CER	2	5	8	10	10	11	0.5	1	20	2.5
No. 3 CER	5	10	15	12	10	13	1.0	5	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Eastern Red Spring (CERS)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CERS	75 (365)	Any variety of the class CERS designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	**0.75**
No. 2 CERS	72 (350)	Any variety of the class CERS designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.04	0.015	0.3	0.04	0.03	1.5
No. 3 CERS	69 (335)	Any variety of the class CERS designated as such by order of the Commission	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.5
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.030	1	**0.25**	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5% – *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Red Spring (CERS), continued

Grade name	Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated: Binburnt, severely mildewed rotted, mouldy %	Heated: Total %
No. 1 CERS	1.0	Nil	1	4	Nil	1.0	**0.75**	1	0.020	0.1
No. 2 CERS	3	0.03	**2.5**	7	Nil	1.0	2	3	0.050	**0.75**
No. 3 CERS	5	0.07	10	10	Nil	1.5	4	5	0.10	2.0
CE Feed	No limit–but not more than 10% amber durum	2	No limit	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*			*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**): Shrunken %	Shrunken and broken (**): Broken %	Shrunken and broken (**): Total %	Smudge and blackpoint: Smudge: Penetrated smudge %	Smudge and blackpoint: Smudge: Total %	Smudge and blackpoint: Total %	Sprouted %
No. 1 CERS	0.5	**1.5**	2.0	6	6	7	0.03	0.30	10	0.5
No. 2 CERS	2	5	8	10	10	11	0.5	1	20	2.5
No. 3 CERS	5	10	15	12	10	13	1.0	5	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Eastern Hard Red Winter (CEHRW)

Grade name	Standard of quality			Foreign material					
	Minimum test weight kg/hL (g/0.5 L)	Variety	Degree of soundness	Ergot %	Excreta %	Matter other than cereal grains %	Sclerotinia %	Stones %	Total %
No. 1 CEHRW	76 (370)	Any variety of the class CEHRW designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	0.75
No. 2 CEHRW	74 (360)	Any variety of the class CEHRW designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.04	0.015	0.3	0.04	0.03	1.5
No. 3 CEHRW	69 (335)	Any variety of the class CEHRW designated as such by order of the Commission	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.5
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.030	1	0.25	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Note: Samples of CEHRW will be graded no lower than No. 3 C.E. account mildew

Wheat, Canada Eastern Hard Red Winter (CEHRW), continued

									Heated	
Grade name	**Contrasting classes %**	**Artificial stain, no residue %**	**Dark immature %**	**Degermed %**	**Fireburnt %**	**Fusarium damage %**	**Grass green %**	**Grasshopper, army worm %**	**Binburnt, severely mildewed, rotted, mouldy %**	**Total %**
No. 1 CEHRW	1.0	Nil	1	4	Nil	1.0	**0.75**	1	0.020	0.1
No. 2 CEHRW	3	0.03	**2.5**	7	Nil	1.0	2	3	0.050	**0.75**
No. 3 CEHRW	5	0.07	10	10	Nil	1.5	4	5	0.10	2.0
CE Feed	No limit–but not more than 10% amber durum	2	No limit	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*			*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

				Shrunken and broken (**)			Smudge and blackpoint			
							Smudge			
Grade name	**Natural stain %**	**Pink %**	**Sawfly, midge %**	**Shrunken %**	**Broken %**	**Total %**	**Penetrated smudge %**	**Total %**	**Total %**	**Sprouted %**
No. 1 CEHRW	0.5	**1.5**	2.0	6	6	7	0.03	0.30	10	0.5
No. 2 CEHRW	2	5	8	10	10	11	0.5	1	20	2.5
No. 3 CEHRW	5	10	15	12	10	13	1.0	5	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Eastern Soft Red Winter (CESRW)

Grade name	Standard of quality			Foreign material					
	Minimum test weight kg/hL (g/0.5 L)	Variety	Degree of soundness	Ergot %	Excreta %	Matter other than cereal grains %	Sclerotinia %	Stones %	Total %
No. 1 CESRW	76 (370)	Any variety of the class CESRW designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	0.75
No. 2 CESRW	74 (360)	Any variety of the class CESRW designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.04	0.015	0.3	0.04	0.03	1.5
No. 3 CESRW	69 (335)	Any variety of the class CESRW designated as such by order of the Commission	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.5
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.030	1	0.25	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Note: Samples of CESRW will be graded no lower than No. 3 C.E. account mildew

Wheat, Canada Eastern Soft Red Winter (CESRW), continued

									Heated	
Grade name	Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CESRW	1.0	Nil	1	4	Nil	1.0	**0.75**	1	0.020	0.1
No. 2 CESRW	3	0.03	**2.5**	7	Nil	1.0	2	3	0.050	**0.75**
No. 3 CESRW	5	0.07	10	10	Nil	1.5	4	5	0.10	2.0
CE Feed	No limit–but not more than 10% amber durum	2	No limit	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*			*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

				Shrunken and broken (**)			Smudge and blackpoint			
							Smudge			
Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken %	Broken %	Total %	Penetrated smudge %	Total %	Total %	Sprouted %
No. 1 CESRW	0.5	1.5	2.0	6	6	7	0.03	0.30	10	0.5
No. 2 CESRW	2	5	8	10	10	11	0.5	1	20	2.5
No. 3 CESRW	5	10	15	12	10	13	1.0	5	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Eastern Amber Durum (CEAD)

	Standard of quality				Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum hard vitreous kernels %**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CEAD	79 (387)	Any variety of the class CEAD designated as such by order of the Commission	80	Reasonably well matured, reasonably free from damaged kernels	0.02	0.010	0.2	0.02	0.03	0.5
No. 2 CEAD	77 (377)	Any variety of the class CEAD designated as such by order of the Commission	60	Reasonably well matured, reasonably free from severely damaged kernels	0.02	0.010	0.3	0.02	0.03	1.5
No. 3 CEAD	74 (362)	Any variety of the class CEAD designated as such by order of the Commission	40	Fairly well matured, may be moderately weather-damaged or frost-damaged, reasonably free from severely damaged kernels	0.04	0.010	0.5	0.04	0.03	2.0
CE Feed Durum	65 (318)	Any variety of amber durum wheat	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	0.1	0.030	1	**0.25**	0.1	10
Grade, if specs for Feed Durum not met	*Wheat, Sample CW Account Light Weight*				*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Amber Durum (CEAD), continued

Grade name	Wheats of other classes or varieties		Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper army worm%	Heated	
	Other classes %	Total %							Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CEAD	2	5	Nil	4	Nil	1.0	0.75	1	0.020	0.1
No. 2 CEAD	3.5	10	0.03	7	Nil	1.0	2	3	0.040	0.25
No. 3 CEAD	5	15	0.07	10	Nil	1.0	4	5	0.060	0.75
CE Feed Durum	49	No limit	2	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for Feed Durum not met	*Wheat, Sample CE Account Admixture*		*Wheat, Sample CE Account Stained Kernels*		*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint			Sprouted %
							Smudge			
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total %	Total %	
No. 1 CEAD	0.5	3	2.0	6	6	7	0.03	0.50	10	0.5
No. 2 CEAD	2	6	8	10	10	10	0.5	1	15	2
No. 3 CEAD	5	10	15	12	10	15	1.0	3	35	7
CE Feed Durum	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for Feed Durum not met					*Sample Broken Grain*					

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Eastern Hard White Winter (CEHWW)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CEHWW	76 (370)	Any variety of the class CEHWW designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	0.75
No. 2 CEHWW	74 (360)	Any variety of the class CEHWW designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.04	0.015	0.3	0.04	0.03	1.5
No. 3 CEHWW	69 (335)	Any variety of the class CEHWW designated as such by order of the Commission	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.5
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.030	1	0.25	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less–*Wheat, Sample CE Account Stones* Over 2.5%–*Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Hard White Winter (CEHWW), continued

									Heated	
Grade name	Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CEHWW	1.0	Nil	1	4	Nil	1.0	0.75	1	0.020	0.1
No. 2 CEHWW	3	0.03	2.5	7	Nil	1.0	2	3	0.050	0.75
No. 3 CEHWW	5	0.07	10	10	Nil	1.5	4	5	0.10	2.0
CE Feed	No limit–but not more than 10% amber durum	2	No limit	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*			*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

				Shrunken and broken (**)			Smudge and blackpoint			
							Smudge			
Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken %	Broken %	Total %	Penetrated smudge %	Total %	Total %	Sprouted %
No. 1 CEHWW	0.5	1.5	2.0	6	6	7	0.03	0.30	10	0.5
No. 2 CEHWW	2	5	8	10	10	11	0.5	1	20	2.5
No. 3 CEHWW	5	10	15	12	10	13	1.0	5	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Eastern White Winter (CEWW)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CEWW	76 (370)	Any variety of the class CEWW designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	1.0
No. 2 CEWW	74 (360)	Any variety of the class CEWW designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.04	0.015	0.3	0.04	0.03	2.0
No. 3 CEWW	69 (335)	Any variety of the class CEWW designated as such by order of the Commission	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.03	3.0
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.030	1	0.25	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern White Winter (CEWW), continued

	Wheats of other classes or varieties								Heated	
Grade name	**Contrasting classes %**	**Total %**	**Artificial stain, no residue %**	**Degermed %**	**Fireburnt %**	**Fusarium damage %**	**Grass green %**	**Grasshopper army worm %**	**Binburnt, severely mildewed, rotted, mouldy %**	**Total %**
No. 1 CEWW	1.0	5	Nil	4	Nil	1.0	0.75	1	0.020	0.1
No. 2 CEWW	2.0	6	0.03	7	Nil	1.0	2	3	0.040	0.25
No. 3 CEWW	3	10	0.07	10	Nil	1.0	4	5	0.060	0.75
CE Feed	No limit–but not more than 10% amber durum		2	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*		*Wheat, Sample CE Account Stained Kernels*		*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

					Smudge and blackpoint			
					Smudge			
Grade name	**Natural stain %**	**Pink %**	**Sawfly, midge %**	**Shrunken and broken % (**)**	**Penetrated smudge %**	**Total %**	**Total %**	**Sprouted %**
No. 1 CEWW	0.5	3	2.0	3	0.03	0.30	10	1.0
No. 2 CEWW	2	6	8	5	0.5	1	15	5
No. 3 CEWW	5	10	15	8	1.0	3	35	8
CE Feed	No limit	No limit	No limit	No limit–maximum 50% broken	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met				*Sample Broken Grain*				

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Eastern Soft White Spring (CESWS)

	Standard of quality			Foreign material					
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CESWS	78 (380)	Any variety of the class CESWS designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	1.0
No. 2 CESWS	74 (360)	Any variety of the class CESWS designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.04	0.010	0.3	0.04	0.03	2.0
No. 3 CESWS	69 (335)	Any variety of the class CESWS designated as such by order of the Commission	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.03	3.0
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.030	1	**0.25**	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Soft White Spring (CESWS), continued

								Heated	
Grade name	**Wheats of other classes or varieties %**	**Artificial stain, no residue %**	**Degermed %**	**Fireburnt %**	**Fusarium damage %**	**Grass green %**	**Grasshopper, army worm %**	**Binburnt, severely mildewed, rotted, mouldy %**	**Total %**
No. 1 CESWS	3	Nil	4	Nil	1.0	**0.75**	1	0.020	0.1
No. 2 CESWS	6	0.03	7	Nil	1.0	2	3	0.040	**0.25**
No. 3 CESWS	10	0.07	10	Nil	1.0	4	5	0.060	**0.75**
CE Feed	No limit–but not more than 10% amber durum	2	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CE Feed not met	50% or less–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*		*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

				Shrunken and broken (**)			Smudge and blackpoint			
							Smudge			
Grade name	**Natural stain %**	**Pink %**	**Sawfly, midge %**	**Shrunken %**	**Broken %**	**Total %**	**Penetrated smudge %**	**Total %**	**Total %**	**Sprouted %**
No. 1 CESWS	0.5	3	2.0	6	6	7	0.03	0.30	10	1.0
No. 2 CESWS	2	6	8	10	10	11	0.5	1	15	5
No. 3 CESWS	5	10	15	No limit	13	No limit within broken tolerances	1.0	3	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Eastern Hard White Spring (CEHWS)

Grade name	Standard of quality			Foreign material					
	Minimum test weight kg/hL (g/0.5 L)	**Variety**	**Degree of soundness**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 CEHWS	75 (365)	Any variety of the class CEHWS designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels	0.04	0.010	0.2	0.04	0.03	**0.75**
No. 2 CEHWS	72 (350)	Any variety of the class CEHWS designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels	0.04	0.015	0.3	0.04	0.03	1.5
No. 3 CEHWS	69 (335)	Any variety of the class CEHWS designated as such by order of the Commission	May be immature or weather-damaged, moderately free from severely damaged kernels	0.04	0.015	0.5	0.04	0.06	3.5
CE Feed	65 (315)	Any class or variety of wheat excluding amber durum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	0.1	0.030	1	**0.25**	0.1	10
Grade, if specs for CE Feed not met	*Wheat, Sample CE Account Light Weight*			*Wheat, Sample CE Account Ergot*	*Wheat, Sample CE Account Excreta*	*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Admixture*	2.5% or less– *Wheat, Sample CE Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Eastern Hard White Spring (CEHWS), continued

									Heated	
Grade name	Contrasting classes %	Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Binburnt, severely mildewed rotted, mouldy %	Total %
No. 1 CEHWS	1.0	Nil	1	4	Nil	1.0	0.75	1	0.020	0.1
No. 2 CEHWS	3	0.03	2.5	7	Nil	1.0	2	3	0.050	0.75
No. 3 CEHWS	5	0.07	10	10	Nil	1.5	4	5	0.10	2.0
CE Feed	No limit–but not more than 10% amber durum	2	No limit	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CE Feed not met	50% or less amber durum–*Wheat, Sample CE Account Admixture*	*Wheat, Sample CE Account Stained Kernels*			*Wheat, Sample CE Account Fireburnt*	*Wheat, Sample CE Account Fusarium Damage*			*Wheat, Sample CE Account Heated*	*Wheat, Sample CE Account Heated*

				Shrunken and broken (**)			Smudge and blackpoint			
							Smudge			
Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken %	Broken %	Total %	Penetrated smudge %	Total %	Total %	Sprouted %
No. 1 CEHWS	0.5	1.5	2.0	6	6	7	0.03	0.30	10	0.5
No. 2 CEHWS	2	5	8	10	10	11	0.5	1	20	2.5
No. 3 CEHWS	5	10	15	12	10	13	1.0	5	35	8
CE Feed	No limit	No limit	No limit	No limit	50	No limit within broken tolerances	No limit	No limit	No limit	No limit
Grade, if specs for CE Feed not met					*Sample Broken Grain*					

(**) See truncation rule for "Shrunken and Broken"

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the commercially clean determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

Dockage is not reported for commercially clean shipments.

Note: For shipments of eastern wheat classes, commercial cleanliness specifications listed in the CWRS commercially clean determinant table is to be used.

Not commercially clean (NCC)

If any of the components exceed the allowable limits as defined in the table, the shipment becomes *not commercially clean*, and dockage is assessed using procedures for primary samples.

Shipments, which do not meet the standards for commercial cleanliness, are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest:

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator.

A deduction of up to 0.2% is applied to take into account the buildup of attritional material for direct shipments only.

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

The purpose of this cleaning is not to remove all foreign material, but rather to reduce the admixture of conspicuous separable material to within the grade tolerance.

Refer to *Cleaning for grade improvement* in the *Determination of dockage* section for full instructions.

Grading

Wheat on export is graded using standard samples and export specifications.

Commercially clean determinant table

					Foreign Material							
Column		1			2	3	4	*5 (2+3+4)	6	7	*8 (2+6+7)	*9 (1+2+4+6+7)
		Broken grain through #5 buckwheat sieve						Total small seeds, attrition and roughage %			Total small seeds, large seeds and wild oats %	Total small seeds, large seeds, wild oats, roughage, and broken grain through #5 buckwheat sieve %
Class	Grade	Ex Primary %	Ex Terminal %	Ex St Lawrence Terminal ** %	Small seeds %	Attrition %	Roughage %		Large seeds %	Wild oats %		
CWRS	No.1, 2, 3	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0.2	0.5
CWHWS	No.1, 2, 3	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0.2	0.5
CWAD	No.1, 2, 3	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.15	0.2	0.5
	No. 4	0.5	0.5	0.5	0.05	0.10	0.05	0.1	0.2	0.15	0.2	0.5
	No. 5	0.5	0.5	0.5	0.05	0.10	0.10	0.1	0.5	0.15	0.5	0.5
CWRW	No.1, 2,3	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.10	0.2	0.5
CWSWS	No.1, 2, 3	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0.2	0.5
CWES	No.1, 2	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.10	0.2	0.5
CPSR	No.1, 2	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.10	0.2	0.5
CPSW	No.1, 2	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.10	0.2	0.5
CNHR	No.1, 2, 3	0.3	0.35	0.5	0.05	0.10	0.05	0.1	0.2	0.05	0.2	0.5
All classes (except CWAD and CWSP)	CW Feed	0.5	0.5	0.5	0.05	0.10	0.10	0.1	0.5	0.1	0.5	0.5
CWSP	No.1, 2	0.5	0.5	0.5	0.05	0.10	0.1	0.1	0.5	0.1	0.5	0.5

* Columns which represent a subtotal of other columns show the columns to be added in parenthesis

** St. Lawrence Terminal includes Montréal, Sorel, Trois-Rivières, Québec, Baie-Comeau, Port-Cartier and Halifax

Export grade determinant tables

Wheat, Canada Western Red Spring (CWRS)

Grade name	Standard of quality				
	Minimum test weight kg/hL (g/0.5 L)	Variety	Minimum hard vitreous kernels %	Minimum protein %	Degree of soundness
No.1 CWRS	79 (385)	Any variety of the class CWRS designated as such by order of the Commission	65	10	Reasonably well matured, reasonably free from damaged kernels
No. 2 CWRS	77.5 (378)	Any variety of the class CWRS designated as such by order of the Commission	No minimum	No minimum	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels
No. 3 CWRS	76.5 (373)	Any variety of the class CWRS designated as such by order of the Commission	No minimum	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels
CW Feed	73 (355)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	No minimum	No minimum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels

	Foreign material							
						Mineral Matter including stones		
	Ergot %	Excreta %	Matter other than cereal grains %	Other Cereal Grain %	Sclerotinia %	Stones %	Total %	Total (*) %
No.1 CWRS	0.04	0.010	0.2	0.4	0.04	0.03	0.06	0.4
No. 2 CWRS	0.04	0.010	0.3	**0.75**	0.04	0.03	0.10	**0.75**
No. 3 CWRS	0.04	0.015	0.5	**1.25**	0.04	0.06	0.10	**1.25**
CW Feed	0.1	0.030	1	5	0.1	0.1	**0.25**	5

(*) Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Red Spring (CWRS) continued

Grade name	Wheats of other classes or varieties (*)		Artificial stain, no residue %	Dark, immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No.1 CWRS	0.5	1.5	Nil	1	4	Nil	0.25	0.75	1	0.005	0.05
No. 2 CWRS	1.5	3	0.05	2.5	7	Nil	0.8	2	3	0.020	0.4
No. 3 CWRS	2.5	5	0.10	10	13	Nil	1.5	10	6	0.030	1.0
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	No limit	2.5	2.5

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint		Sprouted	
				Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No.1 CWRS	0.5	1.5	2.0	4	5	7	0.30	10	0.10	0.5
No. 2 CWRS	2	5	5	4	6	8	1	20	0.20	1.0
No. 3 CWRS	5	10	10	4	7	9	5	35	0.30	3.0
CW Feed	No limit	No limit	No limit	4	13	15	No limit	No limit	No limit	No limit

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Hard White Spring (CWHWS)

Grade name	Standard of quality			
	Minimum test weight kg/hL (g/0.5 L)	Variety	Minimum protein %	Degree of soundness
No.1 CWHWS	79 (385)	Any variety of the class CWHWS designated as such by order of the Commission	10	Reasonably well matured, reasonably free from damaged kernels
No. 2 CWHWS	77.5 (378)	Any variety of the class CWHWS designated as such by order of the Commission	No minimum	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels
No. 3 CWHWS	76.5 (373)	Any variety of the class CWHWS designated as such by order of the Commission	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels
CW Feed	73 (365)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	No minimum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels

	Foreign material							
	Ergot %	Excreta %	Matter other than cereal grains %	Other Cereal Grain %	Sclerotinia %	Mineral Matter including stones		Total (*) %
						Stones %	Total %	
No.1 CWHWS	0.04	0.010	0.2	0.4	0.04	0.03	0.06	0.4
No. 2 CWHWS	0.04	0.010	0.3	0.75	0.04	0.03	0.10	0.75
No. 3 CWHWS	0.04	0.015	0.5	1.25	0.04	0.06	0.10	1.25
CW Feed	0.1	0.030	1	5	0.1	0.1	0.25	5

(*) Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat Canada Western Hard White Spring (CWHWS), continued

Grade name	Wheats of other classes or varieties (*)		Artificial stain, no residue %	Dark, immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No.1 CWHWS	0.5	1.5	Nil	1	4	Nil	0.25	0.75	1	0.005	0.05
No. 2 CWHWS	1.5	3	0.05	2.5	7	Nil	0.8	2	3	0.020	0.4
No. 3 CWHWS	2.5	5	0.10	10	13	Nil	1.5	10	6	0.030	1.0
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	No limit	2.5	2.5

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint		Sprouted	
				Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No.1 CWHWS	0.5	1.5	2.0	4	5	7	0.30	10	0.10	0.5
No. 2 CWHWS	2	5	5	4	6	8	1	20	0.20	1.0
No. 3 CWHWS	5	10	10	4	7	9	5	35	0.30	3.0
CW Feed	No limit	No limit	No limit	4	13	15	No limit	No limit	No limit	No limit

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Amber Durum (CWAD)

Grade name	Standard of quality				
	Minimum test weight kg/hL (g/0.5 L)	**Variety**	**Minimum hard vitreous kernels %**	**Minimum protein %**	**Degree of soundness**
No. 1 CWAD	80 (392)	Any variety of the class CWAD designated as such by order of the Commission	80	9.5	Reasonably well matured, reasonably free from damaged kernels
No. 2 CWAD	79.5 (390)	Any variety of the class CWAD designated as such by order of the Commission	60	No minimum	Reasonably well matured, reasonably free from severely damaged kernels
No. 3 CWAD	78 (382)	Any variety of the class CWAD designated as such by order of the Commission	40	No minimum	Fairly well matured, may be moderately weather-damaged or frost-damaged, reasonably free from severely damaged kernels
No. 4 CWAD	75 (367)	Any variety of the class CWAD designated as such by order of the Commission	No minimum	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels
No. 5 CWAD	73 (357)	Any variety of amber durum wheat	No minimum	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels

	Foreign Material							
						Mineral matter including stones		
Grade name	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Other Cereal Grain %**	**Sclerotinia %**	**Stones %**	**Total %**	**Total (*) %**
No. 1 CWAD	0.02	0.010	0.2	0.5	0.02	0.03	0.06	0.5
No. 2 CWAD	0.02	0.010	0.3	0.8	0.02	0.03	0.10	0.8
No. 3 CWAD	0.04	0.010	0.5	1.0	0.04	0.06	0.10	1.0
No. 4 CWAD	0.04	0.010	0.5	3.0	0.04	0.06	0.10	3.0
No. 5 CWAD	0.1	0.030	1	5	0.1	0.1	0.25	5

(*) Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Amber Durum (CWAD), continued

Grade name	Wheats of other classes or varieties (*)		Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Other classes %	Total %							Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CWAD	2.0	3	Nil	4	Nil	0.5	0.75	1	0.005	0.05
No. 2 CWAD	2.5	5	0.03	7	Nil	0.5	2	3	0.010	0.1
No. 3 CWAD	3.5	7	0.07	10	Nil	2.0	4	5	0.020	0.4
No. 4 CWAD	10	15	0.12	13	Nil	2.0	10	8	0.5	1.5
No. 5 CWAD	15	No limit	2	No limit	2	4	No limit	No limit	5	5

Grade name	Natural stain %	Pink %	Severe midge %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint			Sprouted	
								Smudge				
					Shrunken %	Broken %	Total %	Penetrated smudge %	Total %	Total %	Severely sprouted %	Total %
No. 1 CWAD	0.5	3	0.1	2.0	3	6	7	0.03	0.50	5	0.20	0.5
No. 2 CWAD	2	6	0.25	8	3	8	9	0.25	1	10	0.40	2
No. 3 CWAD	5	10	0.75	15	3	10	11	0.5	3	20	3.0	7
No. 4 CWAD	7.5	No limit	2	40	3	11	12	Consider overall appearance			12	12
No. 5 CWAD	No limit	No limit	No limit	No limit	3	13	15	No limit			No limit	No limit

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Red Winter (CWRW)

	Standard of quality			
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum protein %**	**Degree of soundness**
No. 1 CWRW	79 (386)	Any variety of the class CWRW designated as such by order of the Commission	11	Reasonably well matured, reasonably free from damaged kernels
No. 2 CWRW	76.5 (373)	Any variety of the class CWRW designated as such by order of the Commission	11	Fairly well matured, may be moderately frost damaged, reasonable free from severely damaged kernels
No. 3 CWRW	74 (361)	Any variety of the class CWRW designated as such by order of the Commission	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels
CW Feed	73 (355)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels

	Foreign Material							
						Mineral matter including stones		
Grade name	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Other cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**	**Total (*) %**
No. 1 CWRW	0.04	0.010	0.2	0.4	0.04	0.03	0.06	0.4
No. 2 CWRW	0.04	0.015	0.3	0.7	0.04	0.06	0.10	0.7
No. 3 CWRW	0.04	0.015	0.5	1.3	0.04	0.06	0.10	1.3
CW Feed	0.1	0.030	1	5	0.1	0.1	0.25	5

(*) Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Red Winter (CWRW) continued

Grade name	Wheats of other classes or varieties (*)		Artificial stain, no residue %	Natural Stain %	Blackpoint %	Maximum damage limits				
									Heated	
	Contrasting classes %	Total %				Fireburnt %	Fusarium damage %	Sawfly, midge %	Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CWRW	1.0	3	Nil	0.5	10	Nil	0.8	1.0	0.005	0.05
No. 2 CWRW	2	5	0.07	2	20	Nil	1.0	5	0.010	0.1
No. 3 CWRW	3	10	0.1	5	35	Nil	1.5	7	0.030	0.5
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	2.5	2.5

Grade name	Maximum damage limits (continued)					Shrunken and broken (**)		
	Smudge		Sprouted		Total damage %			
	Penetrated smudge %	Total %	Severely sprouted %	Total %		Shrunken %	Broken %	Total %
No. 1 CWRW	0.03	0.30	0.10	0.5	2	3	3	3
No. 2 CWRW	1.0	3	0.20	1.0	5	3	5	5
No. 3 CWRW	3	5	0.30	2.5	7	3	8	8
CW Feed	No limit	No limit	No limit	No limit	N/A	4	13	15

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"
Note: the specification columns for dark immature, grass green, degermed, pink kernels and grasshopper damage have been removed. Kernels found in a sample exhibiting these characteristics are assessed in the "Total Damage" specification.

Wheat, Canada Western Soft White Spring (CWSWS)

Grade name	Standard of quality		
	Minimum test weight kg/hL (g/0.5 L)	Variety	Degree of soundness
No. 1 CWSWS	78 (380)	Any variety of the class CWSWS designated as such by order of the Commission	Reasonably well matured, reasonably free from damaged kernels
No. 2 CWSWS	**75.5** (368)	Any variety of the class CWSWS designated as such by order of the Commission	Fairly well matured, may be moderately weather-damaged, reasonably free from severely damaged kernels
No. 3 CWSWS	75 (365)	Any variety of the class CWSWS designated as such by order of the Commission	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels
CW Feed	73 (355)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels

	Foreign Material							
						Mineral matter including stones		
Grade name	Ergot %	Excreta %	Matter other than cereal grains %	Other cereal grains %	Sclerotinia %	Stones %	Total %	Total (*) %
No. 1 CWSWS	0.04	0.010	0.2	**0.75**	0.04	0.03	0.06	**0.75**
No. 2 CWSWS	0.04	0.015	0.3	1.0	0.04	0.03	0.10	1.0
No. 3 CWSWS	0.04	0.015	0.5	1.5	0.04	0.06	0.10	1.5
CW Feed	0.1	0.030	1	5	0.1	0.1	**0.25**	5

(*) Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Soft White Spring (CWSWS), continued

Grade name	Wheats of other classes or varieties (*) %	Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
								Binburnt, severely mildewed rotted, mouldy %	Total %
No. 1 CWSWS	1.5	Nil	4	Nil	1.5	0.75	1	0.005	0.05
No. 2 CWSWS	3	0.03	7	Nil	1.5	2	3	0.010	0.1
No. 3 CWSWS	5	0.07	10	Nil	1.5	4	5	0.020	0.4
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP	2	No limit	2	4	No limit	No limit	2.5	2.5

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint			Sprouted	
							Smudge				
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total %	Total %	Severely sprouted %	Total %
No. 1 CWSWS	0.5	3	2.0	3	5	7	0.03	0.30	10	0.10	1
No. 2 CWSWS	2	6	8	3	6	8	0.5	1	15	0.30	5
No. 3 CWSWS	5	10	15	3	7	9	1.0	3	35	0.50	8
CW Feed	No limit	No limit	No limit	4	13	15	No limit	No limit	No limit	No limit	No limit

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Western Extra Strong (CWES)

Grade name	Standard of quality			
	Minimum test weight kg/hL (g/0.5 L)	**Variety**	**Minimum protein %**	**Degree of soundness**
No. 1 CWES	78 (380	Any variety of the class CWES designated as such by order of the Commission	10	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels
No. 2 CWES	76 (370)	Any variety of the class CWES designated as such by order of the Commission	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels
CW Feed	73 (355)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels

	Foreign material							
						Mineral Matter including stones		
	Ergot %	**Excreta %**	**Matter other than cereal grains %**	**Other Cereal Grain %**	**Sclerotinia %**	**Stones %**	**Total %**	**Total (*) %**
No.1 CWES	0.04	0.010	0.2	0.75	0.04	0.03	0.10	0.75
No. 2 CWES	0.04	0.030	0.3	1.5	0.04	0.06	0.10	1.5
CW Feed	0.1	0.030	1	5	0.1	0.1	0.25	5

(*) Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Western Extra Strong (CWES), continued

	Wheats of other classes or varieties (*)								Heated	
Grade name	Contrasting classes %	Total %	Artificial stain, no residue %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CWES	1.5	3	0.05	7	Nil	1.0	2	3	0.005	0.4
No. 2 CWES	2.5	5	0.10	13	Nil	1.0	10	8	0.010	1.0
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	2	4	No limit	No limit	2.5	2.5

				Shrunken and broken (**)			Smudge and blackpoint		Sprouted	
Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No. 1 CWES	2	5	2.0	3	7	8	1	15	0.10	0.5
No. 2 CWES	5	10	5	3	7	8	Consider overall appearance		0.30	2
CW Feed	No limit	No limit	No limit	4	13	15	No limit		No limit	No limit

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Prairie Spring Red (CPSR)

Grade name	Standard of quality		
	Minimum test weight kg/hL (g/0.5 L)	Variety	Degree of soundness
No. 1 CPSR	77 (375)	Any variety of the class CPSR designated as such by order of the Commission	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels
No. 2 CPSR	75 (365)	Any variety of the class CPSR designated as such by order of the Commission	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels
CW/CE Feed	73 (355)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels

	Foreign material							
						Mineral Matter including stones		
	Ergot %	Excreta %	Matter other than cereal grains %	Other Cereal Grain %	Sclerotinia %	Stones %	Total %	Total (*) %
No. 1 CPSR	0.04	0.010	0.2	**0.75**	0.04	0.03	0.10	**0.75**
No. 2 CPSR	0.04	0.030	0.3	1.5	0.04	0.03	0.10	1.5
CW Feed	0.1	0.030	1	5	0.1	0.1	**0.25**	5

(*) Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Prairie Spring Red (CPSR), continued

Grade name	Wheats of other classes or varieties (*)		Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CPSR	3	5	0.05	2.5	7	Nil	1.5	2	3	0.020	0.4
No. 2 CPSR	5	10	0.10	10	13	Nil	1.5	10	8	0.030	1.0
CW/CE Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	No limit	2.5	2.5

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint			Sprouted	
				Shrunken %	Broken %	Total %	Smudge		Total %	Severely sprouted %	Total %
							Penetrated smudge %	Total %			
No. 1 CPSR	2	5	3	5	6	9	0.10	1	20	0.10	0.5
No. 2 CPSR	5	10	8	5	6	9	0.5	5	35	0.30	2
CW/CE Feed	No limit	No limit	No limit	4	13	15	No limit	No limit	No limit	No limit	No limit

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Prairie Spring White (CPSW)

	Standard of quality		
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Degree of soundness**
No. 1 CPSW	77 (375)	Any variety of the class CPSW designated as such by order of the Commission	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels
No. 2 CPSW	75 (365)	Any variety of the class CPSW designated as such by order of the Commission	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels
CW/CE Feed	73 (355)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels

	Foreign material							
						Mineral Matter including stones		
	Ergot %	Excreta %	Matter other than cereal grains %	Other Cereal Grain %	Sclerotinia %	Stones %	Total %	Total (*) %
No. 1 CPSW	0.04	0.010	0.2	**0.75**	0.04	0.03	0.10	**0.75**
No. 2 CPSW	0.04	0.030	0.3	1.5	0.04	0.03	0.10	1.5
CW Feed	0.1	0.030	1	5	0.1	0.1	**0.25**	5

(*) Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Canada Prairie Spring White (CPSW) continued

Grade name	Wheats of other classes or varieties (*)		Artificial stain, no residue %	Dark immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No. 1 CPSW	3	5	0.05	2.5	7	Nil	1.5	2	3	0.020	0.4
No. 2 CPSW	5	10	0.10	10	13	Nil	1.5	10	8	0.030	1.0
CW/CE Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	No limit	2.5	2.5

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint			Sprouted	
				Shrunken %	Broken %	Total %	Penetrated smudge %	Total smudge %	Total %	Severely sprouted %	Total %
No. 1 CPSW	2	5	3	5	6	9	0.10	1	20	0.10	0.5
No. 2 CPSW	5	10	8	5	6	9	0.5	5	35	0.30	2
CW/CE Feed	No limit	No limit	No limit	4	13	15	No limit	No limit	No limit	No limit	No limit

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"

Wheat, Canada Northern Hard Red (CNHR)

	Standard of quality			
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Variety**	**Minimum Protein %**	**Degree of soundness**
No.1 CNHR	79 (385)	Any variety of the class CNHR designated as such by order of the Commission	11	Reasonably well matured, reasonably free from damaged kernels
No. 2 CNHR	77.5 (378)	Any variety of the class CNHR designated as such by order of the Commission	No minimum	Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels
No. 3 CNHR	76.5 (373)	Any variety of the class CNHR designated as such by order of the Commission	No minimum	May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels
CW Feed	73 (355)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	No minimum	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels

	Foreign material							
						Mineral Matter including stones		
	Ergot %	**Excreta %**	**Matter other than cereal grains %**	**Other Cereal Grain %**	**Sclerotinia %**	**Stones %**	**Total %**	**Total (*) %**
No. 1 CNHR	0.04	0.010	0.2	0.4	0.04	0.03	0.06	0.4
No. 2 CNHR	0.04	0.010	0.3	0.75	0.04	0.03	0.10	0.75
No. 3 CNHR	0.04	0.015	0.5	1.25	0.04	0.06	0.10	1.25
CW Feed	0.1	0.030	1	5	0.1	0.1	0.25	5

(*) Total foreign material does not include broken wheat passing through the #5 buckwheat sieve

Wheat, Canada Northern Hard Red (CNHR) continued

Grade name	Wheats of other classes or varieties (*)		Artificial stain, no residue %	Dark, immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Heated	
	Contrasting classes %	Total %								Binburnt severely mildewed rotted, mouldy %	Total %
No.1 CNHR	1	3	Nil	1	4	Nil	0.25	0.75	1	0.005	0.05
No. 2 CNHR	3	5	0.05	2.5	7	Nil	0.8	2	3	0.020	0.4
No. 3 CNHR	5	10	0.10	10	13	Nil	1.5	10	6	0.030	1.0
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	4	No limit	No limit	2.5	2.5

Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken and broken (**)			Smudge and blackpoint		Sprouted	
				Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No.1 CNHR	0.5	1.5	2.0	4	5	7	0.30	10	0.10	0.5
No. 2 CNHR	2	5	5	4	6	8	1	20	0.20	1.0
No. 3 CNHR	5	10	10	4	7	9	5	35	0.30	3.0
CW Feed	No limit	No limit	No limit	4	13	15	No limit	No limit	No limit	No limit

(*) See working tolerance for "Wheats of Other Classes or Varieties"
(**) See truncation rule for "Shrunken and Broken"

5. Rye

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Determination of commercially clean

Dockage is not assessed on rye sample that meet the commercially clean specifications defined in the rye export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.05% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 7 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
    - Official samples shall be at least 1 kg.
    - Unofficial samples shall be at least 1 kg.
2. Place approximately 250 grams of the sample at a time on the No. 4.5 round hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve. (Column #2 in the rye export grade determinant table)
5. Small seeds passing through the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the rye export grade determinant table)
6. The sample portions remaining on top of the No. 4.5 are recombined and divided using a Boerner-type divider to a representative portion of not less than 250 grams.
7. The portion divided from step 6 is handpicked to remove roughage material which is weighed and the percentage calculated. Add the roughage percentage to the total obtained in step 4 to determine if it meets the commercially clean specifications of the grade for small seeds, attrition and roughage. (Column #2 in the rye export grade determinant tables)

    Note: If the roughage material contains unthreshed rye heads, the heads are squeezed to remove the kernels of rye prior to weighing. The rye kernel is not included when assessing the concentration of roughage for commercial cleanliness. However, care should be taken to keep these kernels separate. If it is determined that the sample is "NCC", kernels squeezed from the unthreshed heads will be included in the dockage.

Should the percentage concentration of either of the factors determined in steps 1 through 7 exceed the specifications set out in columns 1 or 2 of the rye export grade determinant chart the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage.*

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after the cleaning assessment has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Rye, Sample CW/CE Account Fireburnt*
- *Rye, Sample Salvage*
- *Rye, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#5
Air control	Minimum #4
Riddle	No. 25 or No. 1
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No 5 buckwheat
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
3. Turn on the Carter dockage tester.

4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two to three seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Remove the aspiration pan.
9. Handpick large whole kernels of rye from the portion passing over the riddle and return them to the cleaned sample.
10. Determine dockage. Use the list under *Composition of dockage.*

Composition of dockage

Dockage includes

- Rye with long rootlets removed by the riddle.
- For samples of rye which are graded *Rye Sample CW/CE Account Sprouted* any rye with long rootlets that was removed by the riddle will be returned to the sample and not assessed as dockage (See *Sprouted)*
- Material other than rye removed by the riddle
- Material removed by aspiration
- Material that passes through the bottom No. 5 buckwheat Carter sieve
- A maximum of 10% soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

Procedures are summarized in the table which follows.

1. After the cleaning assessment has been completed, sieve the sample using the No. 6 buckwheat hand sieve.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, about eight inches.

2. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Rye

Material to be removed	Equipment	Effect on composition of dockage
Broken kernels	No. 6 buckwheat hand sieve	If the weight of broken kernels is over the grade tolerance but is • Less than 5% of the gross weight, add to dockage • 5% or more of the gross weight, broken kernels become a grading factor. Return them to the cleaned sample. See *Broken kernels*

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Agreement of the shipper and unload elevator must be conveyed to the CGC in writing prior to the analysis being performed.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of rye.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Rye, No. 1 CW
4. 0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of rye for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Broken	25	100
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Fusarium damage	10	100
Heated	50	250
Matter other than cereal grains	50	250
Odour	working sample	working sample
Other cereal grains, excluding wheat	50	250
Sclerotinia sclerotiorum	500	working sample
Smudge	working sample	working sample
Soft earth pellets	working sample	working sample
Sprouted	10	50
Stones	250	working sample
Treated seeds	working sample	working sample
Wheat	50	250

Grading factors

Broken (BKN)

Broken kernels are pieces of rye that are less than three-quarters of a whole kernel.

- If the broken kernel has been chewed by insects, it is also considered as broken for grading purposes as long as no mould is evident on the exposed endosperm.
- If the broken kernel has mould on exposed endosperm, it is graded relative to the degree of soundness.

Procedures

- In samples graded *Rye, Sample CW/CE Account Broken* or *Rye, Sample Broken Grain,* handpick any broken rye removed in cleaning but remaining on top of the No. 4.5 round-hole hand sieve. Return it to the cleaned sample.
- For reporting and grading, round down the percentage by weight of broken rye in the cleaned sample to a whole number; for example, 4.9% becomes 4%.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "*Canada Grain Act*" as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the Food and Drugs Act."

Determination as to whether grain is contaminated will be made by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada. Samples deemed to be contaminated are graded *Rye, Sample Condemned.*

Degermed kernels (DGM)

Degermed kernels

- Are considered *Sprouted* if the sample contains other sprouted kernels
- Are considered sound if the sample contains no other sprouted kernels

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Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones.*
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets.*

Ergot (ERG)

Ergot is a plant disease producing elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Rye, Held IP Suspect Contaminated Grain*.

Fireburnt kernels (FBNT)

Fireburnt kernels are charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low-weight kernel which crumbles easily under pressure.

Foreign material (FM)

Foreign material in rye includes all material other than whole or broken rye that remains in the sample after the removal of dockage.

Fusarium damage (FUS DMG)

Fusarium-damaged kernels in rye are chalk-like in appearance and frequently have a fibrous growth in the kernel crease. Rye has a shallow crease and therefore the fibrous growth is frequently removed during handling.

Procedures

Separate all kernels showing any evidence of fusarium damage, including any kernels that have a chalk-like appearance. Apply the following guidelines.

Fusarium-damaged kernels includes

- Chalk-like kernels in combination with a fibrous mould
- Chalk-like kernels without the fibrous mould if the mould is present on other chalk-like kernels in the sample

Do not include

- Chalk-like kernels without the fibrous mould if there are no other chalk-like kernels with mould in the sample

Heated kernels (HTD)

Heated kernels are red or orange, and have the odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. Heated rye is not easily detected because of the natural colour variations that occur in sound rye.

Rotted kernels are included in the tolerance for *Heated*.

Heated seeds of other grains are included in the tolerance for *Heated*.

Matter other than cereal grains (MOTCG)

Matter other than cereal grains includes the following material remaining in the cleaned sample:

- Seeds such as ragweed, Tartary buckwheat, rye grass, wild oats
- Non-cereal domestic grains such as flaxseed, corn, peas, buckwheat or lentils

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is ...	Then the grade is...
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Rye, Sample CW/CE Account Odour*
A distinct heated odour	*Rye, Sample CW/CE Account Heated*
A distinct fireburnt odour	*Rye, Sample CW/CE Account Fireburnt*

Other cereal grains excluding wheat (OCGXWHT)

Other cereal grains, excluding wheat in rye are barley, triticale, oats and groats, including wild oat groats. For wheat, see *Wheat*.

For grading purposes, spelt and Kamut® are considered as *Other cereal grains* in samples of rye.

Rotted (ROT)

See Heated.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Smudge (SM)

Smudge describes the discolouration caused by disease. The dark kernels often found in rye are similar in appearance to wheat kernels which has been affected by blackpoint or smudge.

Procedures

When grading, consider the incidence and severity of the discolouration. There is no specific numeric tolerance. This factor is considered under *Degree of soundness*, as defined in the Primary Grade Determinants tables.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Rye, Sample CW/CE Account Admixture*.

Sprouted kernels (SPTD)

Sprouted kernels show definite signs of germination. Degermed kernels are considered sprouted when the sample contains other sprouted kernels. *(See Degermed)*

▲ **Important**: Kernels with long rootlets which clean out over the No. 25 or No. 1 riddle are either

- Included in dockage, as described in *Composition of dockage*
- Returned to the sample and become a grading factor, in samples graded *Rye, Sample CW/CE, Account Sprouted*

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—500 g	Optimum—1000 g	Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Rye, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Rye, Sample Canada Eastern Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Rye, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for

Rye, Canada Western

Grade name	Stones %
No. 1 CW	0.033
No. 2 CW	0.033
No. 3 CW	0.066

Basic grade:......................... *Rye, No. 2 CW*
Reason for basic grade:....... Mildew

If the above sample contained	Grade in western Canada
0.05% stones	*Rye, Rejected No. 2 CW Account Stones*
1.0% stones	*Rye, Rejected No. 2 CW Account Stones*
3.0% stones	*Rye, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for

Rye, Canada Eastern

Grade name	Stones %
No. 1 CE	0.033
No. 2 CE	0.033
No. 3 CE	0.066

Basic grade:......................... *Rye, No. 2 CE*
Reason for basic grade:....... Mildew

If the above sample contained	Grade in eastern Canada
0.05% stones	*Rye, No. 3 CE*
1% stones	*Rye, Sample CE Account Stones*
3% stones	*Rye, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Rye, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Varieties

Rye is graded without reference to variety.

Wheat (WHT)

Wheat is considered foreign material in rye.

Primary grade determinants tables

Rye, Canada Western/Canada Eastern (CW/CE)

	Standard of quality		Damage				
Grade name	Minimum test weight kg/hL (g/0.5 L)	Degree of soundness	Broken %	Fireburnt %	Fusarium %	Heated %	Sprouted %
No. 1 CW/CE	72 (349)	Well matured, practically free from weather-damaged kernels	4	Nil	**0.25**	0.1	0.5
No. 2 CW/CE	69 (334)	Reasonably well matured, reasonably free from weather-damaged kernels	5	Nil	0.5	**0.75**	2
No. 3 CW/CE	63 (304)	Excluded from higher grades on account of damaged kernels	8	Nil	1	5	10
Grade, when No. 3 specs not met	*Rye, Sample CW/CE Account Light Weight*		50% or less- *Rye, Sample CW/CE Account Broken Grain* Over 50%-*Sample Broken Grain*	*Rye, Sample CW/CE Account Fireburnt*	*Rye, Sample CW/CE Account Fusarium Damage*	*Rye, Sample CW/CE Account Heated*	*Rye, Sample CW/CE Account Sprouted*

	Foreign material						
Grade name	Cereal grains other than wheat %	Ergot %	Excreta %	Matter other than cereal grains %	Sclerotinia %	Stones %	Total %
No. 1 CW/CE	**1.5**	0.06	0.01	0.5	0.06	**0.033**	2
No. 2 CW/CE	3	0.20	0.01	1	0.20	**0.033**	5
No. 3 CW/CE	10	**0.33**	0.02	2	**0.33**	**0.066**	10
Grade, when No. 3 specs not met	See *Mixed grain*	*Rye, Sample CW/CE Account Ergot*	*Rye, Sample CW/CE Account Excreta*	*Rye, Sample CW/CE Account Admixture*	*Rye, Sample CW/CE Account Admixture*	2.5% or less- **West** - *Rye, Rejected (grade) Account Stones* or **East** - *Rye Sample CE Account Stones* Over 2.5%-*Rye, Sample Salvage*	See *Mixed grain*

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean rye.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest:

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator.

A deduction of up to 0.2% is applied to take into account the buildup of attritional material for direct shipments only.

Grading

Rye on export is graded using standard samples and export specifications. Where there are no export specifications, the primary specifications are used.

Export grade determinants tables

Rye, Canada Western (CW)

	Commercially clean		Foreign material										
			Total large seeds and wild oats					Mineral matter					
Grade name	(1) Small seeds %	(2) Total, small seeds, attrition, dust, chaff and roughage %	Large seeds %	Wild oats %	Total %	Cereal grains other than wheat %	Ergot %	Stones %	Total mineral matter %	Sclerotinia %	Total foreign material, including wheat %	Heated %	Sprouted %
No. 1 CW	0.05	0.10	0.10	0.10	0.15	1.5	0.05	**0.033**	**0.066**	0.05	2	0.05	0.5
No. 2 CW	0.05	0.10	0.15	0.10	0.20	3	0.20	**0.033**	0.10	0.20	5	**0.35**	2
No. 3 CW	0.05	0.10	**0.25**	**0.15**	**0.25**	10	**0.33**	**0.066**	**0.15**	**0.33**	10	2	10

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness

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Classes, types and varieties

Classes

Barley is divided into three classes based on end use, malting, food and general purpose.

Malting

Only the varieties on the malting barley variety designation list are eligible for the malting grades. Only about 20 percent of malting barley production is actually *selected* for malting each year. The other 80 percent is used domestically as livestock feed, exported as feed barley or may be selected for food grade.

There is one malting grade *Select*. Malting barley may be covered or hulless varieties. Barley selected for malting that does not qualify for this grade is graded *Barley, Sample Select CW/CE, Two-row/Six-row Account "Factor"*.

Food

Food barley can be any variety of barley (hulless or covered) that has been selected for a food market. There is a growing interest from food processors for barley in food products. Some examples of food uses are ready-to-eat breakfast cereals, rice like products (after splitting and polishing), thickeners, health foods, tea, etc.

General purpose

General purpose grades include covered and hulless barley not selected for malting or food. General purpose barley is used primarily for animal feed.

Types

Covered

The term covered refers to varieties of barley with the outer hull still attached after harvesting. Covered barley varieties may be two-row or six-row.

Hulless

The term hulless refers to varieties of barley in which the outer hull is loosely adhered to the kernel. The outer hull is so loose, that when this barley is harvested in the field, the outer hull is usually removed. Processors often refer to this type of barley as "naked" barley. Hulless barley varieties may be two-row or six-row.

Two-row barley

A head of two-row barley contains two rows of kernels along its length.

Six-row barley

A head of six-row barley contain six rows of kernels along its length, in two groups of three kernels each.

Determination of commercially clean

All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples, that are **clearly** not commercially clean, may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.1% of small seeds without passing the sample over the Carter dockage tester as set up below and weighing the small seeds, then primary dockage assessment procedures can be followed. Where there is any doubt regarding whether the sample is commercially clean, the sample must be analysed using the procedures outlined in steps 1 through 7 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
2. Pass the sample over the Carter dockage tester set up as follows:

Feed control	5
Air control	3
Riddle	None
Top sieve	No. 4.5 round-hole
Centre sieve	Blank tray
Bottom sieve	None
Sieve cleaner control	Off

3. Small seeds passing through the No. 4.5 round-hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the Barley Export grade determinant table)
4. The sample portion passing over the 4.5 round-hole sieve is divided using a Boerner-type divider to a representative portion of not less than 250 grams
5. The portion divided from step 4 is handpicked to remove roughage (as defined in the *Glossary*)
6. Roughage is weighed and the percentage is calculated
7. All material passing through the No. 4.5 round-hole sieve is combined with dust and chaff removed by aspiration and handpicked roughage material are added together to determine if they meet the commercially clean specification of the grade for Total small seeds, attrition, dust, chaff and roughage. (Column #2 in the Barley Export grade determinant table)

Should the percentage concentration of either of the factors determined in steps 1 through 7 exceed the specifications set out in columns 1 or 2 of the barley export grade determinant table, the sample will be considered to be not commercially clean. Dockage will be assessed on samples determined to be not commercially clean by following the procedures defined under *Determination of dockage*.

Determination of dockage

Definitions

Dockage is assessed to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after the cleaning assessment has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Barley, Sample CW/CE, Account Fireburnt*
- *Barley, Sample Salvage*
- *Barley, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#5
Air control	No. 6
Riddle	No. 6
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	Blank tray
Sieve cleaner	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.

3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for 2 to 3 seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.

   ▲ **Important:** These are the normal settings. Ensure when you aspirate general purpose barley that you do not remove light weight barley from the sample.

   If the aspirated material contains lightweight barley,

   1. Return the material to the sample.
   2. Reset the Carter dockage tester with a lower air setting to remove only lightweight dockage material.
   3. Pass it through the Carter dockage tester again.

8. Remove the aspiration pan.
9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material other than barley removed over the No. 6 riddle
- Lightweight material removed by aspiration
- Material that is removed by the No. 5 buckwheat Carter sieve
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

1. After the cleaning assessment has been completed, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement – Barley* for the list of equipment.
2. Sieve the sample by hand, or pass it through the Carter dockage tester, depending on the material.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Barley

Class	Material to be removed	Equipment	Effect on composition of dockage
All classes	**Large seeds**	No. 6 buckwheat hand sieve	Large seeds are • Seeds that do not pass through the No. 4.5 round-hole sieve • Grains other than cereal grains, such as peas, beans, corn flaxseed and domestic buckwheat • Ragweed and Tartary buckwheat Assess material as dockage, provided the grade is improved and not more than 5.0% of barley is removed.
All Classes	**Covered smut and false loose smut**	Carter dockage tester, set up for *Normal cleaning procedures*, with air control set to 7 **Note:** The material originally removed by aspiration is to be reconstituted back into the sample prior to cleaning for improvement.	If the percentage by weight of material removed is • Less than 2.0% of the gross weight of the sample, add to dockage • 2.0% or more of the gross weight of the sample, the sample is sent to the Chief Grain Inspector for review
All Classes	**Attached awns**	Hand rub barley, Carter dockage tester for aspiration	Removes awns Separates detached awns from working sample. Awns removed to be included in dockage.
Hulless type only	**Wild oats, shrunken barley and rye grass**	No. 9x9 wire hand sieve	For the select hulless grades, wild oats, shrunken barley and rye grass removed in the cleaning procedure is included in dockage.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of barley.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Barley, No. 1 CW
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Food Barley

The selection of barley for food purposes is the responsibility of selecting companies. Each individual company has their own selection criteria and specifications. All barley selected for food purposes will be graded according to the specification list in the Barley CW / CE Food primary grade determinant tables.

Malting Barley

The selection of barley for malting purposes is the responsibility of selecting companies. Each individual company has their own selection criteria and specifications. All barley selected for malting purposes will be graded according to the specification list in the Barley CW / CE malting primary grade determinant tables.

Producer Deliveries

Once barley has been selected for malting purposes, if there is a disagreement on the assessment of any factors listed in the "Characteristics of Malt Barley" table, the CGC, upon request will perform an analysis of the disputed factor. A representative portion of not less than 1000 grams of the unload will be forwarded to the CGC along with a request in writing (form I-106 in western Canada or I-107 for eastern Canada) specifying which factors are to be analyzed.

Characteristics of Malt Barley	
Peeled and Broken	Other cereal grains
Sprouted	Wild oats
Barley of other types	Total Foreign Material
Plump and Thin	Protein

Note: Specific tolerances are set by the selecting company.

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of barley for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Adhered hulls	50	100
Barley of other types	10	10
Broken	25	50
Covered smut and false loose smut	working sample	working sample
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	500	working sample
Frost	25	100
Fusarium damage	25	100
Heated	25	100
Inseparable seeds — malting and food	100	250
Inseparable seeds — general purpose	100	250
Odour	working sample	working sample
Other cereal grains	50	250
Peeled and broken	50	100
Plump and thin	250	250
Rotted kernels	50	working sample
Sclerotinia sclerotiorum	500	working sample
Severe mildew	50	working sample
Soft earth pellets	working sample	working sample
Sprouted	25	100
Stones	working sample	working sample
Treated seed	working sample	working sample
Varieties with adhered hulls	50	100
Weathered	working sample	working sample
Wild oats	50	250

Grading factors

Adhered hulls (ADHULLS)

Adhered hulls are kernels of hulless varieties with hulls that have not been removed during harvesting. See *Varieties with adhered hulls*.

Barley of other types (BOOT)

In two-row barley, barley of other types is any six-row variety. In six-row barley, barley of other types is any two-row variety.

Broken (BKN)

Broken kernels are pieces that are less than three-quarters of a whole kernel and kernels with the germ end broken off.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "*Canada Grain Act*" as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Barley, Sample Condemned*.

Covered smut and false loose smut (SMUT)

There are no specific numeric tolerances for smut. In evaluating smut as a grading factor, consider

- The degree of smut tag on the kernels
- The number of pieces of covered smut left in the cleaned sample

If the sample . . .	Then the grade is . .		
	Malting	**Food**	**General purpose**
Contains about 5K of covered smut and no tagged kernels	*Barley, Select Malting CW/CE Two-row/Six-row*	*Barley, Select Food CW/CE Two-row/Six-row*	*Barley, No. 1 CW/CE*
Contains many pieces of covered smut and smut-tagged kernels	*Barley, Sample Select Malting CW/CE Two-row/Six-row, Account Smut*	*Barley, Sample Select Food CW/CE Two-row/Six-row Account Smut*	*Barley, No. 2 CW/CE*
Is severely contaminated	*Barley, Sample Select Malting CW/CE Two-row/Six-row, Account Smut*	*Barley, Sample Select Food CW/CE Two-row/Six-row Account Smut*	*Barley, Sample CW/CE, Account Smut*
	Note: If hulless grades, add "Hulless" to the grade name		

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
- See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction *"Suspect Contaminated Grain, Handling Procedures"* for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Barley, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Frost (FR)

For varieties with hulls—frost-damaged kernels have distinctly indented backs, and usually a loose hull. Kernels with a light wrinkling from frost are not considered frost-damaged.

For hulless varieties—frost-damaged kernels have severe wrinkling and translucent endosperms.

▲ **Important:** Determine frost-damaged kernels and *Peeled and broken* prior to sizing the sample. Sizing tends to peel kernels.

Procedures—Malting and food grades

1. Use a representative portion of at least 25 grams of the cleaned sample.
2. Determine the percentage of frost-damaged kernels.

Fusarium damage (FUS DMG)

Fusarium-damaged kernels of barley are discoloured by pink, orange or black encrustations of fusarium mould. Under magnification, the black encrustations appear raised above the surface of the kernel and are surrounded by a white mould. The black encrustations can be scraped off.

Some degree of judgment is required when identifying kernels with the fusarium mould. Only those kernels which meet this description are to be designated as fusarium damaged.

Procedures

Confirm the presence of fusarium mould using a 10-power magnifying lens.

Heated (HTD)

Heated kernels have the colour or odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. The hull over the germ of the heated kernels often appears discoloured, usually to a golden brown.

Procedures

- A representative portion of the cleaned sample is passed through a barley pearler for up to 10 seconds. When the hull is removed by pearling the germ appears red or brown. As the degree of heat damage increases, a greater portion of the pearled kernel exhibits the red discolouration.
- Heated seeds of other grains are included in the tolerance for *Heated*.

Inseparable seeds (INSEP SDS)

Inseparable seeds are those not removed by the cleaning process, usually large seeds including grains other than cereal grains, such as peas, beans, corn, flaxseed and domestic buckwheat. See *Glossary*.

Procedures

- Assess as dockage if they are removed by *Cleaning for grade improvement*.
- Malting grades may not contain any large oil-bearing seeds such as sunflower seeds, safflower seeds or soybeans.

Large oil-bearing seeds

Large oil-bearing seeds are special crop seeds that may be crushed for oil. They may include sunflower, safflower or soybeans.

Mildew (MIL)

Mildew is a fungal condition that develops in unthreshed grain usually under conditions of excessive moisture. The affected kernels are grayish in colour and lower in quality. In the evaluation of mildew, consider the number of affected kernels and their severity. See *Severe mildew*.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is ...	Then the grade is ...
A distinct, objectionable odour, not associated with the quality of the grain, but not heated or fireburnt	*Barley, Sample Select Malting CW/CE Two-row/Six-row Account Odour* *Barley, Sample Select Food CW/CE Account Odour* *Barley, Sample CW/CE Account Odour*
A distinct, heated odour	*Barley, Sample Select Malting CW/CE Two-row/Six-row Account Heated* *Barley, Sample Select Food CW/CE Account Heated* *Barley, Sample CW/CE Account Heated*
A distinct, fireburnt odour	*Barley, Sample Select Malting CW/CE Two-row/Six-row Account Fireburnt* *Barley, Sample Select Food CW/CE Account Fireburnt* *Barley, Sample CW/CE Account Fireburnt*
	Note: If hulless grade add "Hulless" to the grade name

Other cereal grains (OCG)

Other cereal grains include wheat, rye, oats or triticale remaining in the cleaned sample. For grading purposes, spelt and Kamut® are considered as *Other cereal grains* in samples of barley.

Peeled and broken (PLD BKN)

Peeled kernels are kernels with at least one of the following characteristics:

- One-third or more of the hull is removed, including kernels of hulless barley
- The germ is fully exposed
- The hull is badly frayed or ruptured over the germ end without evidence of germination
- The hull is removed along both edges.

Broken kernels are pieces of kernels that are less than three-quarters of a whole kernel and kernels with the germ end broken off.

▲ **Important:** Determine peeled and broken and frost-damaged kernels prior to sizing the sample. Sizing tends to peel kernels.

Plump and thin kernels (PLMP, THIN)

The process for determining plump and thin kernels is called sizing.

- Plump kernels are kernels that remain on top of or lodged in the No. 6 slotted sieve.
- Thin kernels are kernels that pass through the No. 5 slotted sieve.
- These are a characteristic of malting barley.

▲ **Important:** Determine frost-damaged kernels and peeled and broken prior to sizing the sample. Sizing tends to peel kernels.

Procedures

1. Using a Boerner-type divider, divide a representative portion of not less than 250 grams from the cleaned sample.
2. Set the Carter dockage tester as follows:

Feed control	#5
Air control	Off
Riddle	None
Top sieve	No. 6 slotted
Centre sieve	No. 5 slotted
Bottom sieve	Blank tray
Sieve cleaner control	Off

3. Pass the representative portion through the Carter dockage tester once.
4. When most of the sample has passed over the sieves, turn on the sieve cleaner control for five kicks of the machine to loosen lodged kernels.

   ▲ **Important:** Do not rap sieves in the machine to loosen lodged kernels.

5. Remove each sieve carefully from the machine.
6. Remove lodged kernels from each sieve. Add them to the barley that passed over that sieve.
7. Weigh separately
   - Plump kernels on top of or lodged in No. 6 slotted sieve
   - Thin kernels that passed through the No. 5 slotted sieve

Rotted kernels (ROT KRNL)

Rotted kernels are discoloured, swollen, soft and spongy as a result of decomposition by fungi or bacteria. Consider rotted kernels in combination with severely mildewed and heated.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Severely mildewed (SEVMIL)

Severe mildew refers to kernels that are severely blackened by mildew. See *Mildew*. Consider severe mildew in combination with rotted and heated kernels.

Smut

See Covered smut and false loose smut.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Barley, Sample CW/CE Account Admixture*.

Sprouted (SPTD)

Sprouted kernels show definite signs of germination.

Procedures for malting grades (covered barley only)

1. Select a representative portion of not less than 25 grams.
2. Pass the sample through the pearler for two or three seconds.
3. Analyse the lightly pearled sample for evidence of germination.

Food, general purpose and hulless grades

Analyse without pearling.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Barley, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Barley, Sample Canada Eastern Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Barley, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Barley, CW General Purpose

Grade name	Stones %
No. 2 CW	0.15

Basic grade:......................... *Barley, No. 2 CW*

Reason for basic grade:....... Stained

If the above sample contained	Grade in western Canada
0.5% stones	*Barley, Rejected No. 2 CW Account Stones*
3.0% stones	*Barley, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Barley, CE General Purpose

Grade name	Stones %
No. 2 CE	0.15

Basic grade:........................ *Barley, No. 2 CE*

Reason for basic grade:....... Stained

If the above sample contained	Grade in eastern Canada
0.5% stones	*Barley, Sample CE Account Stones*
3.0% stones	*Barley, Sample Salvage*

Test weight (TWT)

Test weight is the weight of a measured volume of grain expressed in kilograms per hectolitre. If a barley sample contains kernels with attached awns that reduce the test weight and affect the grade, see procedures for *Cleaning for grade improvement*.

Thin kernels (THIN)

The process of determining the percentage by weight of thin kernels is called sizing. For sizing of malting barley, see *Plump and thin kernels*.

Thin kernels are kernels that pass through the No. 5 slotted sieve. These are a characteristic of malting barley.

▲ **Important:** Determine frost-damaged kernels and peeled and broken first. Then size the sample. Sizing tends to peel kernels.

For hulless grades only—the general appearance of the sample and factors other than size are taken into account in grading. Samples scant in sizing requirements but otherwise sound are given the benefit of the doubt in grading.

Procedures

1. Obtain a representative portion of not less than 250 grams of the cleaned sample.
2. Set up the Carter dockage tester as follows:

Feed control	# 5
Air control	Off
Riddle	None
Top sieve	None
Centre sieve	No. 5 slotted
Bottom sieve	Blank tray
Sieve cleaner control	Off

3. Run the representative portion through the Carter dockage tester once.
4. When the bulk of the sample has passed over the sieves, turn on the sieve cleaner control for only five kicks of the machine to loosen lodged kernels.

   ▲ **Important:** Do not rap sieves in the machine to loosen lodged kernels.

5. Weigh thin kernels that pass through the No. 5 slotted sieve

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Barley, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties with adhered hulls

For select food hulless barley—varieties with adhered hulls are considered as *Other cereal grains*.

For general purpose hulless barley—varieties with adhered hulls are any kernels of non-hulless varieties.

Weathered (WEATH)

Weathered kernels are discoloured by weathering to a very deep yellow or light brown. Severely weathered kernels are severely discoloured. They may be dark brown, heavily stained or distinctly bleached and may also be mildewed. Consider the number of affected kernels and their condition when you assess the general colour of the sample.

Wild oats (WO)

Wild oats is an annual grassy weed. The seeds vary in colour from white to black. They are normally more slender than domestic oats, and have a slanting, circular depressed scar, sometimes called a sucker mouth, at the base, and a bent twisted awn.

Primary grade determinants tables

Barley, Canada Western/Canada Eastern Malting (CW/CE)

			Standard of Quality												
				Damage					Foreign Material						
Grade name		Variety	Adhered Hulls %	Fireburnt %	Frost %	Fusarium %	Heated %	Rotted, Severely Mildewed %	Ergot %	Excreta %	Sclerotinia %	Stones %	Inseparable seeds %	Large oil-bearing seeds
Covered	**Select Malting CW/CE Two-row**	Any selected variety of the class Barley, Canada Western/Eastern Malting Two-row designated as such by Order of the Commission	N/A	Nil	2.0	0.2	0.1	Nil	0.025	0.01	0.025	0.02	0.2	Nil
	Select Malting CW/CE Six-row	Any selected variety of the class Barley, Canada Western/Eastern Malting Six-row designated as such by Order of the Commission	N/A	Nil	2.0	0.2	0.1	Nil	0.025	0.01	0.025	0.02	0.2	Nil
Hulless	**Select Malting CW/CE Two-row Hulless**	Any selected variety of the class Barley, Canada Western/Eastern Malting Two-row Hulless designated as such by Order of the Commission	5	Nil	2.0	0.2	0.1	Nil	0.025	0.01	0.025	0.02	0.2	Nil
	Select Malting CW/CE Six-row Hulless	Any selected variety of the class Barley, Canada Western/Eastern Malting Six-row Hulless designated as such by Order of the Commission	5	Nil	2.0	0.2	0.1	Nil	0.025	0.01	0.025	0.02	0.2	Nil
Grade if specs for Select Malting CW/CE Two-row / Six-row (Hulless) not met		Non designated varieties which are selected for malting purposes are only eligible for the grade *Barley, Sample Select Malting CW/CE Two-row/Six-row (Hulless) Account Variety*	Barley Sample Select Malting CW/CE Two-row / six-row Account Adhered Hulls	Barley Sample Select Malting CW/CE Two-row / six-row Account Fireburnt	Barley Sample Select Malting CW/CE Two-row / six-row Account Frost	Barley Sample Select Malting CW/CE Two-row / six-row Account Fusarium Damage	Barley Sample Select Malting CW/CE Two-row / six-row Account Heated	Barley Sample Select Malting CW/CE Two-row / six-row Account Rotted, Severely Mildewed	Barley Sample Select Malting CW/CE Two-row / six-row Account Admixture	Barley Sample Select Malting CW/CE Two-row / six-row Account Excreta	Barley Sample Select Malting CW/CE Two-row / six-row Account Admixture	2.5% or less– *Barley, Rejected (CW grade) Account Stones* or *Barley, Sample CE Account Stones* Over 2.5%– *Barley, Sample Salvage*	Barley Sample Select Malting CW/CE Two-row / six-row Account Admixture	Barley Sample Select Malting CW/CE Two-row / six-row Account Admixture

Note: Barley not selected for malting will be graded according to "General Purpose" grades.

Note: If specs for Select CW/CE Hulless grade not met add "Hulless" to Sample grade name

Barley, Canada Western/Canada Eastern Food (CW/CE)

Grade name		Standard of quality			Damage					
		Varieties with adhered hulls %	Other hulless varieties %	Total adhered hulls %	Broken %	Fireburnt %	Frost %	Fusarium %	Heated, rotted, severely mildewed %	Sprouted %
Covered	Select Food CW/CE Two-row	n/a	-	-	4	Nil	2	0.5	0.2	N/A
	Select Food CW/CE Six-row	n/a	-	-	4	Nil	2	0.5	0.2	N/A
Hulless	Select Food CW/CE Two-row Hulless	Considered as other cereal grains	5	5	4	Nil	2	0.5	0.2	0.5
	Select Food CW/CE Six-row Hulless	Considered as other cereal grains	5	5	4	Nil	2	0.5	0.2	0.5
Grade, if Select food specs not met		50% or less– *Barley, Sample Select Food CW/CE Account Adhered Hulls*		*Barley, Sample Select Food CW/CE Account Adhered Hulls*	*Barley, Sample Select Food Broken Grain*	*Barley, Sample Select Food CW/CE Account Fireburnt*	*Barley, Sample Select Food CW/CE Account Frost*	Barley, Sample Select Food CW/CE Account Fusarium	*Barley, Sample Select Food CW/CE Account Heated*	*Barley, Sample Select Food CW/CE Account Sprouted*

Grade name		Foreign material						
		Ergot %	Excreta %	Inseparable seeds %	Other cereal grains %	Sclerotinia %	Stones %	Total %
Covered	Select Food CW/CE Two-row	0.02	0.01	0.2	2.0	0.02	0.02	2
	Select Food CW/CE Six-row	0.02	0.01	0.2	2.0	0.02	0.02	2
Hulless	Select Food CW/CE Two-row Hulless	0.02	0.01	0.2	2.0	0.02	0.02	2
	Select Food CW/CE Six-row Hulless	0.02	0.01	0.2	2.0	0.02	0.02	2
Grade, if Select food specs not met		*Barley, Sample Select Food CW/CE Account Ergot*	*Barley, Sample Select Food CW/CE Account Excreta*	*Barley, Sample Select Food CW/CE Account Admixture*	50% or less– *Mixed Grain, CW/CE Barley*	*Barley, Sample Select Food CW/CE Account Admixture*	2.5% or less– *Barley, Rejected (CW grade) Account Stones* or *Barley, Sample CE Account Stones* Over 2.5%– *Barley, Sample Salvage*	50% or less– *Mixed Grain, CW/CE Barley*

Note: Barley not selected for food will be graded according to "General Purpose" grades

Note: If specs for Food CW/CE Hulless grade not met add "Hulless" to Sample grade name

Barley, Canada Western/Canada Eastern General Purpose (CW/CE)

	Grade name	Standard of quality						Damage				
		Minimum test weight kg/hl (g/0.5 l)		Varieties with adhered hulls %	Other hulless varieties %	Total adhered hulls %	Degree of soundness	Broken %	Fireburnt %	Fusarium %	Heated, rotted, severely mildewed %	Sprouted %
		CW	CE									
Covered	No. 1 CW/CE	63 (303)	60 (288)	-	-	-	Reasonably sweet, may be frost-damaged, weather-stained or otherwise damaged	15	Nil	1.0	0.5	10
	No. 2 CW/CE	57 (274)	54 (260)	-	-	-	Fairly sweet, excluded from other grades of barley on account of immature or severely damaged kernels	25	0.5	1.0	**2.5**	20
Hulless	No.1 CW/CE Hulless	72 (352)	72 (352)	10	No limit	10	Reasonably sweet, may be frost-damaged, weather-stained or otherwise damaged	15	Nil	1.0	0.5	10
	No. 2 CW/CE Hulless	65 (314)	65 (314)	20	No Limit	20	Fairly sweet, excluded from other grades of barley on account of immature or severely damaged kernels	25	0.5	1.0	2.5	20
Grade, if No. 2 specs not met		*Barley, Sample CW Account Light Weight*	*Barley, Sample CE Account Light Weight*					*Barley, Sample CW/CE Broken Grain*	*Barley, Sample CW/CE Account Fireburnt*	*Barley, Sample CW/CE Account Fusarium Damage*	*Barley, Sample CW/CE Account Heated*	*Barley, Sample CW/CE Account Sprouted*

	Grade name	Foreign material							
		Ergot %	Excreta %	Inseparable seeds %	Other cereal grains %	Sclerotinia %	Stones %	Wild oats %	Total %
Covered	No. 1 CW/CE	0.05	0.020	0.2	**2.5**	0.05	**0.15**	1	**2.5**
	No. 2 CW/CE	0.1	0.020	0.2	8	0.1	**0.15**	**2.5**	10
Hulless	No. 1 CW/CE Hulless	0.05	0.020	0.2	2.5	0.05	0.15	1	2.5
	No. 2 CW/CE Hulless	0.1	0.020	0.2	8	0.1	0.15	2.5	10
Grade, if No. 2 specs not met		*Barley, Sample CW/CE Account Ergot*	*Barley, Sample CW/CE Account Excreta*	*Barley, Sample CW/CE Account Admixture*	50% or less– *Mixed Grain CW/CE Barley*	*Barley, Sample CW/CE Account Admixture*	2.5% or less– **West** - *Barley, Rejected (CW grade) Account Stones or* **East** - *Barley Sample CE Account Stones* Over 2.5% – *Barley, Sample Salvage*	50% or less– *Mixed Grain CW/CE Barley*	50% or less– *Mixed Grain CW/CE Barley*

Note: If specs for CW/CE Hulless grade not met add "Hulless" to Sample grade name

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean barley.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean*. Such shipments are possible only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest:

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator.

A deduction of up to 0.2% is applied to take into account the buildup of attritional material for direct shipments only.

Grading

Western malting and food barley on export is graded in accordance with primary standards and specifications.

Export grade determinants tables

Grade name	Commercial cleanliness	
	(1) Small seeds %	(2) Total, small seeds, attrition, dust, chaff and roughage %
Select Malting/Food CW two-row	0.1	0.3
Select Malting/Food CW six-row	0.1	0.3

Grade name	Foreign material									
	Commercial cleanliness		Ergot %	Inseparable seeds %	Other cereal grains %	Mineral matter		Sclerotinia %	Wild oats %	Total %
	(1) Small seeds %	(2) Total, small seeds, attrition, dust, chaff and roughage %				Stones %	Total %			
No. 1 CW	0.1	0.3	0.05	0.2	2.5	**0.15**	**0.25**	0.05	1	2.5
No. 2 CW	0.1	0.3	0.1	0.2	8	**0.15**	**0.25**	0.1	2.5	10

Grade name	Sizing		Damage	
	Plump %	Thin %	Heated %	Broken %
No. 1 CW	No limit	No limit	0.5	15
No. 2 CW	No limit	No limit	2.5	25

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness.

7. Oats

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Determination of commercially clean

Dockage is not assessed on oat samples that meet the commercially clean specifications defined in the oats export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are clearly not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.1% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under Determination of dockage. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 7 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
2. Place approximately 250 grams of the sample at a time on the No. 5 buckwheat sieve nested over the No. 4.5 round hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve.
   (Column # 1 in the oat export grade determinant table)
5. Small seeds passing the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #2 in the oat export grade determinant table)
6. Large seeds removable by the No. 5 buckwheat sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for large seeds removable by the No. 5 buckwheat sieve. (Column #3 in the oat export grade determinant table) (See definition of large seeds in *Glossary*)
7. The percentages of material through the No. 4.5 round hole sieve and large seeds removable by the No. 5 buckwheat sieve are added together to determine if they meet the commercially clean specification for total removable material. (Column #4 in the oat export grade determinant table)

Should the percentage concentration of any of the factors determined in steps 1 through 7 exceed the specifications set out in columns 1 to 4 of the oat export grade determinant table the sample will be considered to be not commercially clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage*.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after the cleaning assessment has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- Oats, Sample CW/CE, Account Fireburnt
- Oats, Sample Salvage
- Oats, Sample Condemned

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#5
Air control	#3
Riddle	No. 6
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
3. Turn on the Carter dockage tester.

4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two to three seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.

   ▲ **Important:** These are the normal settings. Ensure when you are aspirating lightweight oats that fully developed, sound oats are not removed from the sample.

   If the aspirated material contains whole, sound oats,
   1. Return the material to the sample.
   2. Reset the dockage tester with a lower air setting to remove only lightweight dockage material.
   3. Pass it through the Carter dockage tester again.

8. Remove the aspiration pan.
9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material removed over the No. 6 riddle
- Lightweight material removed by aspiration
- Material that is removed by the No. 5 buckwheat sieve
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done any time after the cleaning assessment has been completed.

1. After the cleaning assessment has been completed, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement Oats* for the list of equipment.
2. Sieve the sample by hand, or pass it through the Carter dockage tester, depending on the material.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about 8 inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Oats

Material to be removed	Equipment	Effect on composition of dockage
Large seeds	No. 6 buckwheat hand sieve	Large seeds are • Seeds that do not pass through the No. 4.5 round-hole sieve • Grains other than cereal grains, such as peas, beans, corn, flaxseed and domestic buckwheat • Ragweed and Tartary buckwheat Assess material as dockage, provided the grade is improved and not more than 5.0% of oats are removed.
Covered smut and false loose smut	Carter dockage tester, set up for Normal cleaning procedures, but with air control set to 7 **Note:** The material originally removed by aspiration is to be reconstituted back into the sample prior to cleaning for improvement.	If the percentage by weight of material removed is • Less than 2.0% of the gross weight of the sample, add to dockage • 2.0% or more of the gross weight of the sample, the sample is sent to the Chief Grain Inspector for review.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of oats.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Oats, No. 1 CW
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Recommended portion of oats for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Barley	25	100
Cereal grains other than barley and wheat	25	100
Covered smut and false loose smut	working sample	working sample
Damage	10	50
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	500	working sample
Frost damage	5	25
Fusarium damage	25	100
Green	10	50
Heated	25	100
Hulled	25	100
Large seeds	50	250
Mildew	25	50
Odour	working sample	working sample
Rotted	25	working sample
Sclerotinia sclerotiorum	500	working sample
Soft earth pellets	working sample	working sample
Stones	working sample	working sample
Thins	250	250
Treated Seed	working sample	working sample
Wheat	25	100
Wild oats	25	100

Grading factors

Barley (BLY)

There is a separate tolerance for barley in oats.

Cereal grains other than barley and wheat

Cereal grains other than barley and wheat refers to rye and triticale.
For grading purposes, spelt and Kamut® are considered as *Other cereal grains* in samples of oats.

Colour (CLR)

Colour is a component of the degree of soundness, and evaluated using approved oat colour guides.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Oats, Sample Condemned.*

Covered smut and false loose smut (SMUT)

There are no specific numeric tolerances for smut. In evaluating covered smut as a grading factor, consider

- The degree of smut tag on the kernels
- The number of pieces of covered smut left in the cleaned sample

If the sample . . .	Then the grade is . . .
Contains about 5K of covered smut and no tagged kernels	*Oats, No. 1 or No. 2 CW/CE*
Contains many pieces of covered smut and smut-tagged kernels	*Oats, No. 3 CW/CE* or *Oats, No. 4 CW/CE*
Is severely contaminated	*Oats, Sample CW/CE Account Smut*

Damage (DMG)

Kernels are damaged if the groats are fireburnt, heated, frost-damaged, insect damaged, sprouted, mildewed, green, badly weather stained, affected by fusarium or are otherwise damaged.

Weather stained and/or mildewed groats are considered damaged if there is significant brown or black discolouration on 50% or more of the groat or the discolouration penetrates into the groat.

Frost damage is not included in the 4CW/CE total damage, and total damage and foreign material tolerances.

Determination of damage by mechanical hulling

1. Hull a divided representative portion of the clean sample to yield at least 25 grams of groats.
2. Determine the weight of damaged groats as a percentage of hulled groats.

Determination of damage by manual hulling

Use this method only if a mechanical huller is not available. To determine the percentage by weight of damaged kernels,

1. Divide a representative portion of not less than 5 grams from the cleaned sample.
2. Hull all kernels to establish whether the groats are damaged.
3. To accurately determine the percentage by weight of damaged kernels, weigh the affected groat and the oat hull together.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies that have a purplish-black exterior, a purplish-white to off-white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Oats, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt kernels have been charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel that crumbles easily under pressure.

Foreign material (FM)

Foreign material is anything other than oats that remains in the sample after the removal of dockage. Some types of foreign material have separate tolerances.

Frost damage (FR)

Frost-damaged kernels of oats have a black or sunken ventral side and gray or black groats. Frost-damaged oat groats show discolouration in the ventral crease as a dark line. The discolouration may extend throughout the groats depending on the severity of frost damage. There is no limit for frost damage in Oats, No. 4 CW/CE.

Procedures

Cut the kernels lengthwise through the ventral side and examine the groats to confirm frost damage symptoms.

Fusarium damage (FUS DMG)

Fusarium damage is rare on oats. It resembles fusarium damage in barley. Kernels are discoloured by pink, orange or black encrustations of fusarium mould. Under magnification, the black encrustations appear raised above the surface of the kernel and are surrounded by a white mould. The black encrustations can be scraped off.

Some degree of judgment is required when identifying kernels with the fusarium mould. Only those kernels which meet this description are to be designated as fusarium damaged.

Procedures

Confirm the presence of fusarium damage using a 10-power magnifying lens.

Green (GR)

Green kernels in oats are an indication of immaturity.

- Green hulls are assessed in the general colour of the sample.
- Green groats are considered damaged.

Procedures

Manually or mechanically hull the appropriate portion and examine the groats for green discolouration. Green groats are assessed as damaged. See *Damage*.

Heated (HTD)

Heated kernels have the colour or odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. When the hull of a heated oat is removed, the groat appears brown or orange-red.

Rotted kernels are included in the tolerance for *Heated*

Heated seeds of other grains are included in the tolerance for *Heated.*

Procedures

Manually or mechanically hull the appropriate portion and examine the groats.

If the discolouration affects . . .	The kernel is considered . . .
The entire groat	Heated
Less than the entire groat	Damaged

Hulled and hulless (HULL)

Hulled oats have the hulls removed. Hulless oats have loose hulls which are usually removed during harvesting.

Groats are the oat kernels without the hulls.

If oats appear to be unprocessed and contain 75.0% or more of hulless oats,

- Grade the sample according to the primary or export grade specifications except for the tolerances for hulled and hulless kernels.
- Add *hulless* to the grade name, for example, *Oats, No. 1 CW/CE Hulless*.
- When determining moisture content, use the hulless oats conversion table.

Large seeds (LSDS)

Large seeds are domestic and wild seeds that remain on top of the No. 4.5 round-hole sieve. Large seeds are assessed

- As dockage if they are removed by *Cleaning for grade improvement*
- As large seeds and included in *Total damage and foreign material* if they remain in the sample

Mildew (MIL)

Mildew is a fungal condition that develops in unthreshed grain usually under conditions of excessive moisture. The affected kernels are grayish in colour and lower in quality. In the evaluation of mildew, consider the number of affected kernels and their severity.

- Hull discolouration is assessed in the general colour of the sample.
- Discoloured groats are considered as damaged when there is significant brown or black discolouration on 50% or more of the groat or the discolouration penetrates into the groat.

Procedures

Manually or mechanically hull the appropriate portion and examine the groats for mildew discolouration. Mildewed groats are assessed as damaged. See *Damage*.

If the discolouration is . . .	The sample is considered . . .
On the groats, from mildew	Damaged
On the hull, but groats are undamaged	Superficially mildewed, but sound

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Oats, Sample CW/CE, Account Odour*
A distinct heated odour	*Oats, Sample CW/CE, Account Heated*
A distinct fireburnt odour	*Oats, Sample CW/CE, Account Fireburnt*

Rotted (ROT)

Rotted kernels are discoloured, swollen, and soft and spongy as a result of decomposition by fungi or bacteria. Rotted kernels in oats are considered as heated.
See *Heated*.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Oats, Sample CW/CE Account Admixture*.

Sprouted (SPTD)

Sprouted kernels show definite signs of germination. Sprouted oats are assessed as damaged. See *Damage*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Oats, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Oats, Sample Canada Eastern Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Oats, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Oats, Canada Western

Grade name	Stones %
No. 1 CW	0.017
No. 2 CW	0.066
No. 3 CW	0.15
No. 4 CW	0.15

Basic grade:.......................... *Oats, No. 1 CW*

If the above sample contained	Grade in western Canada
0.05% stones	*Oats, Rejected No. 1 CW Account Stones*
1.0% stones	*Oats, Rejected No. 1 CW Account Stones*
3.0% stones	*Oats, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Oats, Canada Eastern

Grade name	Stones
No. 1 CE	0.017
No. 2 CE	0.066
No. 3 CE	0.15
No. 4 CE	0.15

Basic grade:.......................... Oats, No. 1 CE

If the above sample contained	Grade in eastern Canada
0.05% stones	*Oats, No. 2 CE*
1.0% stones	*Oats, Sample CE Account Stones*
3.0% stones	*Oats, Sample Salvage*

Total damage and foreign material (TDMG&FM)

Total damage and foreign material includes all foreign material and all damage. Frost damage is not included in No. 4 CW/CE Oats. When assigning a grade, choose the most appropriate grade as indicated in the table below.

If any one of, or the total of *Barley or Cereal grains other than wheat and barley* or *Wheat* or *Wild* oats is...	and *Total damage* is . . .	Then the grade is . . .
Greater than the 4 CW/CE tolerance	Equal to or less than the 4 CW/CE tolerance	See procedures for Mixed grain
Equal to or less than the 4CW/CE tolerance	Greater than the 4 CW/CE tolerance	Oats, Sample CW/CE, Account Damage
Individually, each is less than the 4 CW/CE tolerance, but together they are greater than the 4 CW/CE tolerance for Total damage and Foreign Material		Oats, Sample CW/CE, Account Damage and Foreign Material

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Oats, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Varieties (VAR)

Oats are graded without reference to variety. However, for samples containing 75% or more of a hulless oats, *Hulless* forms part of the grade name, and tolerances for *Hulled and hulless* are disregarded.

Wheat (WHT)

There is a separate tolerance for wheat in oats.

Wild oats (WO)

Wild oats is an annual grassy weed. The seeds vary in colour from white to black. They are normally more slender than domestic oats, and have a slanting, circular depressed scar, sometimes called a sucker mouth, at the base, and a bent twisted awn.

Special analyses

Upon request, samples may be analyzed for other factors. The shipper of the oats indicates which factors are to be analyzed and which sieves to use.

Thins

The process for determining thin kernels is called sizing. Thin kernels are kernels that pass through the No. 5 slotted sieve or the sieve specified by the shipper.

Procedures

1. Using a Boerner-type divider, divide a representative portion of not less than 250 grams from the cleaned sample.
2. Set the Carter dockage tester as follows:

Feed control	#5
Air control	Off
Riddle	None
Top sieve	None
Centre sieve	No. 5 slotted or as specified by the shipper
Bottom sieve	Blank tray
Sieve cleaner control	Off

3. Pass the representative portion through the Carter dockage tester once.
4. When most of the sample has passed over the sieves, turn on the sieve cleaner control for five kicks of the machine to loosen lodged kernels.

   ▲ **Important:** Do not rap sieves in the machine to loosen lodged kernels.
5. Remove each sieve carefully from the machine.
6. Remove lodged kernels from each sieve. Add them to the oats that passed over the sieve.
7. Weigh the kernels that passed through the sieve to determine the percentage of thins.

Primary grade determinants tables

Oats, Canada Western (CW)

Grade name	Standard of quality		Hulled and hulless %	Damage				
	Minimum test weight kg/hL (g/0.5 L)	Degree of soundness		Fireburnt %	Frost %	Fusarium %	Heated / Rotted %	Total %
No. 1 CW	56 (260)	Good colour, 98% sound groats	6	Nil	0.1	0.1	Nil	2
No. 2 CW	53 (245)	Good colour, 96% sound groats	8	Nil	4	2.0	0.1	4
No. 3 CW	51 (235)	Fair colour, 94% sound groats	20	Nil	6	4	0.5	6
No. 4 CW	48 (220)	Poor colour 92% sound groats	No limit—If sample contains 75% or more of hulless oats, hulless becomes part of the grade name	**0.25**	No limit. Not included in total damage assessment	6	1	8 excluding frost
Grade, if No 4 specs not met	*Oats, Sample CW Account Light Weight*	*Oats, Sample CW Account Damage and Foreign Material*		*Oats, Sample CW Account Fireburnt*		*Oats, Sample CW Account Fusarium Damaged*	*Oats, Sample CW Account Heated*	*Oats, Sample CW Account Damage*

Note: Samples of Oats, CW will be graded no lower than No. 4 CW account colour

Oats, Canada Western (CW), continued

	Foreign material										
	Other cereal grains and wild oats										
Grade name	Barley %	Cereal grains other than wheat or barley %	Wheat %	Wild oats %	Total	Large seeds %	Sclerotinia %	Stones %	Ergot %	Excreta %	Total damage and foreign material %
No. 1 CW	**0.75**	1	**0.75**	1	2	0.2	Nil	**0.017**	Nil	0.005	2
No. 2 CW	**1.5**	2	**1.5**	2	4	0.3	0.05	**0.066**	0.025	0.01	4
No. 3 CW	3	3	3	3	6	0.5	0.05	**0.15**	0.025	0.02	6
No. 4 CW	8	8	8	8	8	1	0.1	**0.15**	0.05	0.02	8 excluding frost
Grade, if No. 4 specs not met	See *Mixed grain*	See *Mixed grain*	See *Mixed grain*	50% or less - see mixed grain. Over 50% - Mixed Feed Oats	See *Mixed grain*	*Oats, Sample CW Account Admixture*	*Oats, Sample CW Account Admixture*	2.5% or less– *Oats, Rejected (grade) Account Stones* Over 2.5% – *Oats, Sample Salvage*	Oats, Sample CW Account Ergot	Oats, Sample CW Account Excreta	*Oats, Sample CW Account Damage and Foreign Material*

Note: Samples of Oats, CW will be graded no lower than No. 4 CW account colour

Oats, Canada Eastern (CE)

Grade name	Standard of quality		Hulled and hulless %	Damage				
	Minimum test weight kg/hL (g/0.5 L)	Degree of soundness		Fireburnt %	Frost %	Fusarium %	Heated / Rotted %	Total %
No. 1 CE	51 (235)	Good colour, 98% sound groats	6	Nil	0.1	0.1	Nil	2
No. 2 CE	49 (225)	Good colour, 96% sound groats	8	Nil	4	2.0	0.1	4
No. 3 CE	46 (210)	Fair colour, 94% sound groats	20	Nil	6	4	0.5	6
No. 4 CE	43 (195)	Poor colour 92% sound groats	No limit—If sample contains 75% or more of hulless oats, hulless becomes part of the grade name	**0.25**	No limit. Not included in total damage assessment	6	1	8 excluding frost
Grade, if No.4 specs not met	*Oats, Sample CE Account Light Weight*	*Oats, Sample CE Account Damage and Foreign Material*		*Oats, Sample CE Account Fireburnt*		*Oats, Sample CE Account Fusarium Damaged*	*Oats, Sample CE Account Heated*	*Oats, Sample CE Account Damage*

Note: Samples of Oats, CE will be graded no lower than No. 4 CE account colour

Oats, Canada Eastern (CE), continued

Grade name	Foreign material											Total damage and foreign material %
	Other cereal grains and wild oats					Large seeds %	Sclerotinia %	Stones %	Ergot %	Excreta %		
	Barley %	Cereal grains other than wheat or barley %	Wheat %	Wild oats %	Total							
No. 1 CE	0.75	1	0.75	1	2	0.2	Nil	**0.017**	Nil	0.005		2
No. 2 CE	1.5	2	1.5	2	4	0.3	0.05	**0.066**	0.05	0.01		4
No. 3 CE	3	3	3	3	6	0.5	0.05	**0.15**	0.05	0.02		6
No. 4 CE	8	8	8	8	8	1	0.1	**0.15**	0.1	0.02		8 excluding frost
Grade, if No.4 specs not met	See *Mixed grain*	See *Mixed grain*	See *Mixed grain*	50% or less - see mixed grain Over 50% - Mixed Feed Oats	See *Mixed grain*	*Oats, Sample CE Account Admixture*	*Oats, Sample CE Account Admixture*	2.5% or less– *Oats, Sample CE Account Stones* Over 2.5% – *Oats, Sample Salvage*	Oats, Sample CE Account Ergot	Oats, Sample CE Account Excreta		*Oats, Sample CE Account Damage and Foreign Material*

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean oats.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material for direct shipments only.

Grading

Western oats on export are graded using export specifications. All other oats are exported using primary specifications.

Export grade determinants tables

Oats, Canada Western (CW)

Grade name	(1) Total material through No. 4.5 round hole sieve %	(2) Small seeds %	(3) Large seeds through No. 5 buckwheat sieve %	(4) (1) + (3) Total removable material %
No. 1 CW	0.2	0.10	0.2	0.2
No. 2 CW	0.2	0.10	0.2	0.2
No. 3 CW	0.2	0.10	0.2	0.2
No. 4 CW	0.2	0.10	0.2	0.2

	Damage and foreign material													
	Damage							Mineral matter						
Grade name	Frost %	Heated / Rotted %	Total damage %	Barley %	Cereal grains other than wheat or barley %	Ergot %	Large seeds %	Stones %	Total %	Sclerotinia %	Wheat %	Wild oats %	Total damage and foreign material %
No. 1 CW	0.1	Nil	2	**0.75**	1	Nil	0.2	**0.017**	**0.033**	Nil	**0.75**	1	2
No. 2 CW	4	0.1	4	**1.5**	2	**0.025**	0.3	**0.066**	**0.066**	**0.025**	**1.5**	2	4
No. 3 CW	6	0.5	6	3	3	**0.025**	0.5	**0.15**	**0.25**	**0.025**	3	3	6
No. 4 CW	No limit	1	8 excluding frost	8	8	0.05	1	**0.15**	**0.25**	**0.25**	8	8	8 excluding frost

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness

8. Triticale

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Determination of commercially clean

Dockage is not assessed on triticale samples that meet the commercially clean specifications defined in the triticale export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.05% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 7 below to confirm that the sample is not commercially clean prior to assessing a dockage.

Using a Boerner-type divider, divide the sample to obtain a representative portion.

- Official samples shall be at least 1 kg.
- Unofficial samples shall be at least 1 kg.

2. Place approximately 250 grams of the sample at a time on the No. 4.5 round hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve.
   (Column #2 in the triticale export grade determinant table)
5. Small seeds passing through the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the triticale export grade determinant table)
6. The sample portions remaining on top of the No. 4.5 are recombined and divided using a Boerner-type divider to a representative portion of not less than 250 grams.
7. The portion divided from step 6 is handpicked to remove roughage material which is weighed and the percentage calculated. Add the roughage percentage to the total obtained in step 4 to determine if it meets the commercially clean specifications of the grade for small seeds, attrition and roughage. (Column #2 in the Triticale export grade determinant tables)

   Note: If the roughage material contains unthreshed triticale heads, the heads are squeezed to remove the kernels of triticale prior to weighing. The triticale kernel is not included when assessing the concentration of roughage for commercial cleanliness. However, care should be taken to keep these kernels separate. If it is determined that the sample is "NCC", kernels squeezed from the unthreshed heads will be included in the dockage.

Should the percentage concentration of either of the factors determined in steps 1 through 7 exceed the specifications set out in columns 1 or 2 of the triticale export grade determinant table the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage.*

Determination of dockage

Definitions

Dockage is assessed to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by the following cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after the cleaning assessment has been completed.

Dockage not reported

▲ **Important**: Dockage is not reported for samples graded

- Triticale, Sample Canada Account Fireburnt
- Triticale, Sample Salvage
- Triticale, Sample Canada Account Admixture, where all removable material is similar to the admixture
- Triticale, Sample Condemned

Normal cleaning procedures

▲ **Important**: Wear gloves and a mask to handle any samples that you suspect may contain hazaradous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	#5
Riddle	No. 25
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two or three seconds to remove kernels lodged in the sieve.
6. Turn off the Carter dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Examine the material passing through the No. 5 buckwheat sieve.

   If any significant amount of small whole triticale passed through the No. 5 buckwheat sieve, you must resieve this portion over the No. 5 buckwheat hand sieve. Return any triticale remaining on the sieve to the cleaned sample.
9. Handpick sound large kernels of triticale from the portion passing over the riddle and return them to the cleaned sample. Do not pick kernels with long rootlets. See *Composition of dockage* and *Sprouted*.
10. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Triticale with long rootlets removed by the riddle.
  For samples of triticale which are graded *Triticale Sample CAN Account Sprouted* any triticale with long rootlets that was removed by the riddle will be returned to the sample and not assessed as dockage. (See *Sprouted*)

- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material other than triticale removed by the No. 25 riddle
- Material removed by aspiration
- Material that has passed through the No. 5 buckwheat Carter sieve
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

1. After the cleaning assessment has been completed, sieve the sample by hand using the appropriate sieve. See the table *Cleaning for grade improvement Triticale* for the list of sieves.

▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

2. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Triticale

Material to be removed	Equipment	Effect on composition of dockage
Broken kernels	No. 6 buckwheat hand sieve	If the weight of broken kernels is over the grade tolerance but is • Less than 5.0% of the gross weight, add to dockage • 5.0% or more of the gross weight, broken kernels becomes a grading factor. Return them to the cleaned sample. See *Broken*.
Stones	No. 6 buckwheat hand sieve	If the weight of wheat removed as a percentage of the gross weight of the sample is • 5.0% or less, assess as dockage • More than 5.0%, see *Stones*, or the relevant grade determinants table.
Foreign material	No. 6 buckwheat hand sieve or the No. 9x9 wire hand sieve.	Foreign material includes cockle, wild oats and pin oats.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of triticale.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Triticale, No. 1 CAN
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of triticale for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Broken	25	100
Cereal grains other than wheat	50	250
Degermed	10	50
Ergot	working sample	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Fusarium damage	10	100
Heated	50	250
Matter other than cereal grains	100	250
Odour	working sample	working sample
Sclerotinia sclerotiorum	500	working sample
Smudge including blackpoint	50	100
Soft earth pellets	working sample	working sample
Sprouted	10	50
Stones	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Blackpoint (BLK PT)

Blackpoint kernels have a distinct dark brown or black discolouration of the whole germ and surrounding area. Disregard a slight discolouration restricted to the germ. See *Smudge* and *Smudge, including blackpoint.*

Broken (BKN)

Broken kernels are pieces of triticale that are less than three-quarters of a whole kernel.

Procedures

- In samples graded *Triticale, Sample Broken Grain*, return to the cleaned sample any broken triticale removed in cleaning but remaining on top of the No. 4.5 round-hole hand sieve.
- For reporting and grading, round down the percentage by weight of broken triticale to a whole number.

Cereal grains other than wheat

Cereal grains other than wheat in triticale includes rye, barley, oats, oat groats and wild oat groats.
For grading purposes, spelt and Kamut® are considered as *Other cereal grains* in samples of triticale.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Triticale, Sample Condemned.*

Degermed (DGM)

Degermed kernels

- Are considered *Sprouted* if the sample contains other sprouted kernels
- Are considered sound if the sample contains no other sprouted kernels

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Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

- Ergot is a plant disease producing elongated fungus bodies having a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Procedure

- Determine the weight of ergot as a percentage of the net weight of the sample.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Triticale, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt kernels are kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Foreign material (FM)

Foreign material in triticale includes all material other than whole or broken triticale that remains in the sample after the removal of dockage. Many of the materials have their own separate tolerances.

Fusarium damage (FUS DMG)

Fusarium-damaged kernels in triticale are typically chalklike in appearance and frequently contain a fibrous growth appearing in the crease of the kernel. Due to the kernel shape, the fibrous growth is often rubbed off some of the kernels.

In assessing fusarium damage in triticale, the following guidelines should be applied:

- Chalklike kernels in a combination with a fibrous mould are fusarium damaged.
- Chalklike kernels without a fibrous mould are fusarium damage if the mould is present in other chalklike kernels in the sample.
- Chalklike kernels without the fibrous mould in samples where there are no other chalklike kernels with mould are not considered fusarium damaged.

Procedures, for severely infested samples

1. Using a Boerner-type divider, divide the representative portion.
2. Separate all kernels showing any evidence of fusarium damage, including any kernels that have a chalk-like appearance.
3. You may examine kernels using a 10-power magnifying lens to confirm evidence of a white or pinkish mould or fibrous growth. In determining fusarium damage, use only kernels with this white or pinkish mould or growth.

Heated (HTD)

Heated kernels have the colour or odour typical of grain that has deteriorated in storage or has been damaged by artificial drying. Heated triticale is not easily detected because of the natural colour variations that occur in sound triticale. Heated kernels of triticale are red or orange.

Heated seeds of other grains are included in the tolerance for *Heated.*

Matter other than cereal grains (MOTCG)

Matter other than cereal grains is

- Inseparable seeds such a ragweed, Tartary buckwheat, rye grass, wild oats
- Non-cereal domestic grains such as flaxseed, corn, peas, buckwheat and lentils that remain in the cleaned sample.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	**Then the grade is . . .**
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Triticale, Sample Canada Account Odour*
A distinct heated odour	*Triticale, Sample Canada Account Heated*
A distinct fireburnt odour	*Triticale, Sample Canada Account Fireburnt*

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Smudge (SM)

Smudge is a discolouration on the kernel The discolouration may be brown, black or red. The discolouration is considered smudge if more than one-half the kernel is discoloured or if the discolouration extends into the crease.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency.

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Triticale, Sample CAN Account Admixture*.

Sprouted (SPTD)

Sprouted kernels show definite signs of germination.

▲ **Important**: Kernels with long rootlets which clean out over the No. 25 riddle are either

- Included in the dockage, as described in *Composition of dockage*
- Returned to the sample and become a grading factor, in samples graded *Triticale, Sample Canada Account Sprouted*

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Triticale, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Triticale, Sample CAN Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Triticale, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Triticale, Canada

Grade name	Stones %
No. 1 Canada	0.033
No. 2 Canada	0.033
No. 3 Canada	0.066

Basic grade:......................... *Triticale, No. 2 Canada*
Reason for basic grade:....... Mildew

If the above sample contained	Grade in western Canada
0.05% stones	*Triticale, Rejected No. 2 Canada Account Stones*
1.0% stones	*Triticale, Rejected No. 2 Canada Account Stones*
3.0% stones	*Triticale, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Triticale, Canada

Grade name	Stones %
No. 1 Canada	0.033
No. 2 Canada	0.033
No. 3 Canada	0.066

Basic grade:......................... *Triticale, No. 2 Canada*
Reason for basic grade:....... Mildew

If the above sample contained	Grade in eastern Canada
0.05% stones	*Triticale, No. 3 Canada*
1.0% stones	*Triticale, Sample Canada Account Stones*
3.0% stones	*Triticale, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Triticale, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances

Varieties

Triticale is graded without reference to variety.

Primary grade determinants tables

Triticale, Canada (CAN)

	Standard of quality		Foreign material						
Grade name	**Minimum test weight kg/hL (g/0.5 L)***	**Degree of soundness**	**Cereal grains other than wheat %**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 Canada	65 (315)	Reasonably well matured, reasonably free from damaged kernels	1	0.025	0.01	0.5	0.025	**0.033**	**2.5**
No. 2 Canada	62 (301)	Fairly well matured, reasonably free from severely damaged kernels	2	0.05	0.01	1	0.05	**0.033**	4
No. 3 Canada	No minimum	Reasonably sweet, excluded from higher grades on account of light weight or damaged kernels	3	0.1	0.03	2	0.1	**0.066**	7
Grade, if No. 3 specs not met			See *Mixed grain*	*Triticale, Sample Canada Account Ergot*	*Triticale, Sample Canada Account Excreta*	*Triticale, Sample Canada Account Admixture*	*Triticale, Sample Canada Account Admixture*	2.5% or less– **West** - *Triticale, Rejected (grade) Account Stones* or **East** - *Triticale, Sample Canada Account Stones,* Over 2.5% – *Triticale, Sample Salvage*	See *Mixed grain*

	Damage					
Grade name	**Broken %**	**Fireburnt %**	**Fusarium %**	**Heated %**	**Smudge and blackpoint %**	**Sprouted %**
No. 1 Canada	4	Nil	**0.25**	0.1	10	0.5
No. 2 Canada	7	Nil	0.5	**0.75**	15	2
No. 3 Canada	50	Nil	1	5	No limit	10
Grade, if No. 3 specs not met	*Sample Broken Grain*	*Triticale, Sample Canada Account Fireburnt*	Triticale, Sample Canada Account Fusarium Damage	*Triticale, Sample Canada Account Heated*		*Triticale, Sample Canada Account Sprouted*

* Use wheat test weight conversion table

Export shipments

Export shipments can be commercially clean or not commercially clean. Dockage is not reported for commercially clean shipments.

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean triticale.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material for direct shipments only.

Grading

Triticale on export is graded according to export specifications.

Export grade determinants tables

Triticale, Canada (CAN)

Grade name	Commercial cleanliness		Foreign material									Damage	
			Seeds and wild oats				Mineral matter						
	(1) Small seeds %	(2) Total small seeds, attrition, dust, chaff and roughage %	Large seeds %	Wild oats %	Total %	Cereal grains other than wheat %	Stones %	Total %	Ergot %	Sclerotinia %	Total foreign material, including wheat %	Sprouted %	Heated %
No. 1 Canada	0.05	0.10	0.2	0.2	0.3	1	0.033	0.066	0.025	0.025	2.5	0.5	0.05
No. 2 Canada	0.05	0.10	0.4	0.4	0.6	2	0.033	0.10	0.05	0.05	4	2	0.35
No. 3 Canada	0.05	0.10	1	1	1.5	3	0.066	0.15	0.1	0.1	7	10	2.5

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness

9. Mixed grain

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Composition of Mixed Grain

Mixed grain consists of any mixture of wheat, rye, barley, oats, triticale, wild oats and domestic or wild oat groats which is excluded from other established grades on account of such mixtures.

Determination of commercially clean

Dockage is not assessed on mixed grain samples that meet the commercially clean specifications defined in the mixed grain export grade determinant table. All samples must be analyzed to determine if they are commercially clean prior to dockage assessment. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.1% of small seeds without hand sieving and weighing the seeds then dockage will be assessed using procedures defined under *Determination of dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures outlined in steps 1 through 5 below to confirm that the sample is not commercially clean prior to assessing a dockage.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
    - Official samples shall be at least 1 kg.
    - Unofficial samples shall be at least 1 kg.
2. Place approximately 250 grams of the sample at a time on the No. 4.5 round-hole hand sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. All material passing through the No. 4.5 round-hole sieve is weighed and the percentage calculated to determine if it meets the commercially clean specification of the grade for material removable through the No. 4.5 round hole sieve. (Column #2 in the mixed grain export grade determinant table)
5. Small seeds passing through the No. 4.5 round hole sieve are weighed and the percentage calculated to determine if they meet the commercially clean specification of the grade for small seeds. (Column #1 in the mixed grain export grade determinant table)

Should the percentage concentration of either of the factors determined in steps 1 through 5 exceed the specifications set out in columns 1 or 2 of the mixed grain export grade determinant table the sample will be considered to be not commercial clean. Dockage will be assessed on samples determined to be not commercially clean by using the procedures defined under *Determination of dockage*.

Determination of dockage

▲ **Important:** When a sample is to be graded as mixed grain, return dockage to the cleaned sample, and begin *Normal cleaning procedures* described in this section.

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow Normal cleaning procedures, using the Carter dockage tester.
2. Follow procedures for Cleaning for grade improvement. This cleaning can be done at any time after the cleaning assessment has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- Mixed Grain, Sample CW/CE Account Fireburnt
- Mixed Grain, Sample Salvage
- Mixed Grain, Sample Condemned

▲ **Important:** When a sample is to be graded as mixed grain, return dockage to the cleaned sample, and begin *Normal cleaning procedures* described in this section.

Normal cleaning procedures

1. Set up the Carter dockage tester as follows:

Feed control	6
Air control	Minimum 4
Riddle	No. 6
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No. 4.5 round-hole
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples shall be at least 1 kg.
    - Unofficial samples shall be at least 1 kg.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control for two to three seconds to remove kernels lodged in the sieve.
6. Turn off the dockage tester.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
8. Remove the aspiration pan.
9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material handpicked or removed over the No. 6 riddle
- Lightweight material removed by aspiration
- Material that passes through the No. 4.5 round-hole sieve
- Material such as large seeds removed by the No. 5 buckwheat sieve in excess of the grade tolerence for total foreign material
- A maximum of 10% of soft earth pellets handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

1. After the cleaning assessment has been completed, sieve the sample, using the No. 6 buckwheat hand sieve.

    ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

2. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement

Material to be removed	Equipment	Effect on composition of dockage
Large seeds	No. 6 buckwheat hand sieve	Large seeds are seeds that pass through the No. 6 buckwheat sieve. Add them to dockage.
Stones	No. 6 buckwheat hand sieve	Add all stones that pass through the No. 6 buckwheat sieve to dockage.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of mixed grain.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

Example
95.0% Mixed Grain CW Wheat
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. For grading, percentages by weight refer to percentages of the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of mixed grain for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Broken	25	50
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Fusarium damage	25	100
Heated	25	100
Large seeds	100	250
Odour	working sample	working sample
Sclerotinia sclerotiorum	500	working sample
Soft earth pellets	working sample	working sample
Stones	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Broken (BKN)

Broken kernels are pieces of grain that are less than three-quarters of a whole kernel.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Mixed Grain, Sample Condemned*.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies having a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Procedures

- Determine the weight of ergot as a percentage of the net weight of the sample.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction *"Suspect Contaminated Grain, Handling Procedures"* for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Mixed Grain, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt kernels are kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Heated (HTD)

Heated kernels are kernels having the colour and odour typical of grain that has heated in storage or has been damaged by artificial drying, but not charred kernels. Heated includes all *heated* seeds in the sample.

Large seeds (LSDS)

Large seeds are seeds that do not pass through the No. 4.5 round-hole sieve and grains other than cereal grains, such as peas, beans, corn, flaxseed and domestic buckwheat. Large seeds remaining in the sample are included in *Total foreign material.*

Odour (HTD)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	Then the grade is
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Mixed grain, Sample CW/CE, Account Odour*
A distinct heated odour	*Mixed grain, Sample CW/CE, Account Heated*
A distinct fireburnt odour	*Mixed grain, Sample CW/CE, Account Fireburnt*

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets constituting 10.0% or less of the sample are assessed as dockage.
3. Where soft earth pellets represent more than 10% of the net weight, the sample is graded *Mixed Grain, Sample CW/CE Account Admixture*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Mixed Grain, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Mixed Grain, Sample CE Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Mixed Grain, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Mixed Grain, Canada Western (CW)

Grade name	Stones %
Mixed Grain CW Wheat	0.1
Mixed Grain CW Rye	0.1
Mixed Grain CW Barley	0.1
Mixed Grain CW Oats	0.1
Mixed Grain CW Triticale	0.1
Mixed Grain CW	0.1

Basic grade:......................... *Mixed Grain, CW Wheat*

If the above sample contained	Grade in western Canada
0.2% stones	*Mixed Grain, Rejected CW Wheat Account Stones*
1.0% stones	*Mixed Grain, Rejected CW Wheat Account Stones*
3.0% stones	*Mixed Grain, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Mixed Grain, Canada Eastern (CE)

Grade name	Stones %
Mixed Grain CE Wheat	0.1
Mixed Grain CE Rye	0.1
Mixed Grain CE Barley	0.1
Mixed Grain CE Oats	0.1
Mixed Grain CE Triticale	0.1
Mixed Grain CE	0.1

Basic grade:......................... *Mixed Grain, CE Wheat*

If the above sample contained	Grade in eastern Canada
0.2% stones	*Mixed Grain, Sample CE Account Stones*
1.0% stones	*Mixed Grain, Sample CE Account Stones*
3.0% stones	*Mixed Grain, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Mixed grain, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary grade determinants tables

Mixed Grain, Canada Western (CW)

Grade name	** Composition
Mixed Grain CW Wheat	Mixtures of cereal grains and wild oats, containing greater than 50% wheat
Mixed Grain CW Rye	Mixtures of cereal grains and wild oats, containing greater than 50% rye
Mixed Grain CW Barley	Mixtures of cereal grains and wild oats, containing greater than 50% barley
Mixed Grain CW Oats	Mixtures of cereal grains and wild oats, containing greater than 50% oats
Mixed Grain CW Triticale	Mixtures of cereal grains and wild oats, containing greater than 50% triticale
Mixed Grain CW	Mixtures of cereal grains and wild oats, no single cereal grain exceeding 50% but containing 50% or greater of total cereal grains

	Damage			Foreign material				
Grade name	Broken %	Fireburnt %	Heated %	Ergot %	Excreta %	Sclerotinia %	Stones %	Total %
Mixed Grain CW Wheat	20	0.5	10	0.1	0.02	**0.25**	0.1	2
Mixed Grain CW Rye	20	0.5	10	0.1	0.02	**0.25**	0.1	2
Mixed Grain CW Barley	20	0.5	10	0.1	0.02	**0.25**	0.1	2
Mixed Grain CW Oats	20	0.5	10	0.1	0.02	**0.25**	0.1	2
Mixed Grain CW Triticale	20	0.5	10	0.1	0.02	**0.25**	0.1	2
Mixed Grain CW	20	0.5	10	0.1	0.02	**0.25**	0.1	2
Grade, if specs for Mixed Grain not met	50% or less – *Sample Feed Grain* Over 50% – *Sample Broken Grain*	*Mixed Grain, Sample CW Account Fireburnt*	*Mixed Grain, Sample CW Account Heated*	*Mixed Grain, Sample CW Account Ergot*	*Mixed Grain, Sample CW Account Excreta*	*Mixed Grain, Sample CW Account Admixture*	2.5% or less – *Mixed Grain, Rejected (grade) Account Stones* Over 2.5% – *Mixed Grain, Sample Salvage*	*Mixed Grain, Sample CW Account Admixture*

* All grades must have less than 50% by weight of wild oats

** Mixed Grain grade codes are included under the predominant grain in the product segregation handbook i.e. Mixed Grain CW Oats grain code is 03 - 0440

Mixed Grain, Canada Eastern (CE)

Grade name	** Composition
Mixed Grain CE Wheat	Mixtures of cereal grains and wild oats, containing greater than 50% wheat
Mixed Grain CE Rye	Mixtures of cereal grains and wild oats, containing greater than 50% rye
Mixed Grain CE Barley	Mixtures of cereal grains and wild oats, containing greater than 50% barley
Mixed Grain CE Oats	Mixtures of cereal grains and wild oats, containing greater than 50% oats
Mixed Grain CE Triticale	Mixtures of cereal grains and wild oats, containing greater than 50% triticale
Mixed Grain CE	Mixtures of cereal grains and wild oats, no single cereal grain exceeding 50% but containing 50% or greater of total cereal grains

	Damage			Foreign material				
Grade name	Broken %	Fireburnt %	Heated %	Ergot %	Excreta %	Sclerotinia %	Stones %	Total %
Mixed Grain CE Wheat	20	0.5	10	**0.25**	0.02	**0.25**	0.1	2
Mixed Grain CE Rye	20	0.5	10	**0.25**	0.02	**0.25**	0.1	2
Mixed Grain CE Barley	20	0.5	10	**0.25**	0.02	**0.25**	0.1	2
Mixed Grain CE Oats	20	0.5	10	**0.25**	0.02	**0.25**	0.1	2
Mixed Grain CE Triticale	20	0.5	10	**0.25**	0.02	**0.25**	0.1	2
Mixed Grain CE	20	0.5	10	**0.25**	0.02	**0.25**	0.1	2
Grade, if specs for Mixed Grain not met	50% or less– *Sample Feed Grain* Over 50%– *Sample Broken Grain*	*Mixed Grain, Sample CE Account Fireburnt*	*Mixed Grain, Sample CE Account Heated*	*Mixed Grain, Sample CE Account Ergot*	*Mixed Grain, Sample CE Account Excreta*	*Mixed Grain, Sample CE Account Admixture*	2.5% or less– *Mixed Grain, Rejected (grade) Account Stones* Over 2.5%– *Mixed Grain, Sample Salvage*	*Mixed Grain, Sample CE Account Admixture*

* All grades must have less than 50.0% by weight of wild oats

** Mixed Grain grade codes are included under the predominant grain in the product segregation handbook. ie. Mixed Grain CW Oats grain code is 03 - 0440

Export shipments

Shipments can be commercially clean or not commercially clean. Dockage is not reported for commercially clean shipments

Commercially clean

Shipments are defined as commercially clean when meeting the commercially clean specifications listed in the export grade determinant table upon following the *Determination of commercially clean* procedures described in this chapter.

No dockage is reported for samples representing commercially clean mixed grain.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material for direct shipments only.

Grading

Mixed grain on export is graded in accordance with export specifications. Where there is no export specification the primary specification and procedures are used. The composition of samples is shown on all records and endorsed on the backs of certificates.

Export grade determinants tables

Mixed Grain, Canada Western/Canada Eastern (CW/CE)

Grade name	Foreign material other than cereal grains and wild oats						Heated %
	Material through #4.5 round-hole sieve						
	(1) Small seeds %	(2) Total %	Ergot %	Sclerotinia %	Stones %	Total %	
Mixed Grain CW/CE Wheat	0.10	0.2	0.1	**0.25**	0.1	2	10
Mixed Grain CW/CE Rye	0.10	0.2	0.1	**0.25**	0.1	2	10
Mixed Grain CW/CE Barley	0.10	0.2	0.1	**0.25**	0.1	2	10
Mixed Grain CW/CE Oats	0.10	0.2	0.1	**0.25**	0.1	2	10
Mixed Grain CW/CE Triticale	0.10	0.2	0.1	**0.25**	0.1	2	10
Mixed Grain CW/CE	0.10	0.2	0.1	**0.25**	0.1	2	10

The area inside dashed lines refers to factors which are assessed in determining commercial cleanliness

10. Canola and rapeseed

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Classes and varieties

Canola and rapeseed are classes of the same botanical family.

This chapter describes dockage and grading procedures for canola and rapeseed. Canola has been used in the examples of grade names. If a sample of rapeseed is submitted for inspection, replace *Canola* with *Rapeseed*.

▲ **Important:** Ensure you use the correct grain code. Codes are different for canola and rapeseed.

Canola

The term canola applies to varieties that meet the canola standards for low levels of erucic acid and glucosinolates. Production of canola varieties is widespread.

Rapeseed

Rapeseed varieties are produced in small volumes, usually under contract. Shipments and submitted samples of rapeseed must be clearly identified as rapeseed.

▲ **Important:** Canola and rapeseed may be visually indistinguishable. However, their end uses are quite different. If you are not sure if the sample is canola or rapeseed, send the sample to the Chief Grain Inspector.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the manual.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after the cleaning assessment has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Canola, Sample Canada Account Fireburnt*
- *Canola, Sample Salvage*
- *Canola, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any sample which you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	# 3
Air control	# 5
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner	Off

2. You also need the following hand sieves:

Round-hole sieves	Slotted sieves
No. 5	No. .028
No. 5.5	No. .032
No. 6	No. .035
No. 6.5	No. .038
No. 7	No. .040
No. 7.5	

3. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples shall be at least 1 kg.
    - Unofficial samples shall be at least 1 kg.
4. For hand sieving use approximately 250 g per sieving

    ▲ **Important**:

    - Select the appropriate sized sieves.
    - When you use a slotted hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

    1. Use the round-hole sieve that will allow reasonably sound canola to pass thru the sieve while removing large material.
    2. Use the slotted sieve that will reduce the admixture of conspicuous inseparable material to within the grade tolerance with a minimum loss of reasonably sound canola.

5. Combine the separated, cleaned 250-g portions.
6. Turn on the Carter dockage tester.
7. Run the entire working sample through the Carter dockage tester for aspiration only.
8. Using a Boerner-type divider, divide the sample to a portion of not less than 10 g.
9. Analyze the 10-g portion to determine the percentage by weight of conspicuous admixture and soft earth pellets.
10. Determine the dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material that remains on top of the round-hole sieve
- Material that passes through the slotted sieve
- Material removed by aspiration
- Material that passes over the No. 000 riddle
- Conspicuous admixture, up to established grade tolerances, handpicked from the cleaned sample

  —In *Canola, Rejected (grade) Account Stones*, dockage includes Conspicuous admixture handpicked from the cleaned sample up to the tolerance for the grade of the sample.

  —In *Sample* grades, Conspicuous admixture is not included as dockage. When the weight of the Conspicuous admixture exceeds 2.0% of the net weight, the Conspicuous admixture becomes a second reason for the sample grade. This is recorded in Remarks.

- Soft earth pellets handpicked from the cleaned sample
- Material removed by *Cleaning for grade improvement*

Primary samples, commercially clean

Commercially clean primary samples, other than submitted samples, can have up to 0.5% for broken and reasonably sound canola or rapeseed deducted from the gross weight of the dockage.

Primary samples are considered commercially clean when meeting the requirements set out in the table below after following *Normal Cleaning Procedures*.

Definition of commercial cleanliness, canola

Grade name	Material other than canola remaining on top of round-hole sieve and over No. 000 riddle %		Total net dockage %
	Roughage material such as wild oats, seed pods, knuckles	Total	
No. 1 Canada	0.3	0.5	2.5
No. 2 Canada	0.3	0.5	2.5
No. 3 Canada	0.3	0.5	2.5

Primary samples, not commercially clean

In not commercially clean primary samples, there is no allowance for broken and reasonably sound canola or rapeseed. All the material removed by the slotted sieve is assessed as dockage.

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

1. After the cleaning assessment has been completed, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement—Canola* for the list of equipment.
2. Sieve the sample by hand or pass it through the Carter dockage tester, depending on the material.

   ▲ **Important:** When you use a slotted hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Canola

Material to be removed	Equipment	Effect on composition of dockage
Weed seeds, broken grain or like material	Carter dockage tester with air setting at #7, or approved round-hole or slotted sieves.	Weed seeds and other material removed including canola, are added to dockage. Not more than 5.0% of sound canola may be removed for each single grade improvement achieved.
Damaged seeds	Carter dockage tester with air setting at #7, or approved sieves. **Note:** The material originally removed by aspiration is to be reconstituted back into the sample prior to cleaning for improvement.	Damaged seeds and other material, including canola, are added to dockage. Not more than 5.0% of sound canola may be removed for each single grade improvement achieved.

Cleaning sample grade canola

For canola that qualifies only for *Sample Canada, Account Admixture* after cleaning for grade improvement, dockage is assessed using the No. .035 slotted sieve, the round-hole sieve appropriate for the admixture, and the Carter dockage tester with air control set at #5.

For canola that qualifies only for *Sample Canada, Account Damaged* after cleaning for grade improvement, dockage is assessed using the appropriate round-hole and slotted sieves and the Carter dockage tester with air control set at #5. Use the slotted sieve appropriate for removing material consisting mainly of weed seeds and small broken grain. Also consider the maximum tolerance for inseparable admixture for these samples.

▲ **Important:** Variations from the above settings require authority from the Chief Grain Inspector.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of canola.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

Example
95.0% Canola, No. 1 CAN
4.0% Barley, No. 1 CW
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Crush

A crush is one pass of the roller under firm pressure over a seed stick on masking tape.

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of canola or rapeseed for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Conspicuous admixture	5	50
Damage	5 g and/or 500 seeds	15 g and/or 1000 seeds
Distinctly green	500 seeds	1000 seeds
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Heated	500 seeds	1000 seeds
Inconspicuous admixture	1	5
Insect excreta	100	500
Odour	working sample	working sample
Rime	5	25
Sclerotinia sclerotiorum	100	500
Staghead	10	25
Stones	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Broken (BKN)

Any broken canola that remains in the sample after cleaning and is otherwise sound is considered to be sound.

Colour (CLR)

In assessing colour, consider

- The amount and degree of discolouration of the whole seed, such as from weathering
- The amount of rime (seeds densely and completely covered by rime are assessed as *Damage*)
- The proportion of crushed seeds which are only pale green or slightly immature and therefore not assessed as distinctly green

Note: Whole seeds that are green may be as a result of thin seed coats of certain canola varieties. Whole green seeds of these varieties are not indicators of elevated chlorophyll levels and therefore are not considered distinctly green or assessed as part of colour evaluation. Only seeds which are distinctly green throughout when crushed are assessed as distinctly green.

▲ **Important**: Where colour is the grade determinant, use the description under *Degree of soundness* in the *Primary grade determinants* table to assign the grade. The Canola/Rapeseed Colour Guide may be used to assist in the determination of distinctly green seeds.

Conspicuous admixture (CADMX)

Conspicuous admixture refers to material that remain in the sample after cleaning and is easily distinguished from canola without the use of magnification, including

- Domestic seeds such as flaxseed, yellow mustard or yellow *Brassica carinata*, and whole shrunken or broken kernels of other grains
- Weed seeds such as cow cockle, lamb's-quarters, cleavers, smartweed, ball mustard and pigweed
- Conspicuous foreign material such as ergot, excreta, insect excreta, sclerotinia and stones

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Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Canola, Sample Condemned.*

Damage (DMG)

Damage in canola includes seeds that are

- Distinctly shrunken or shriveled
- Badly discoloured from mould
- Completely and densely covered with rime
- Excessively weathered, sprouted, tan coloured, distinctly green, heated, insect damaged or otherwise damaged

Total damage is the total of damaged crushed seeds and any visually damaged uncrushed seeds.

Procedures

1. Divide the sample to the appropriate representative portion.
2. Handpick the representative portion for visually damaged seeds.
3. Determine the percentage concentration by weight.

Note: See distinctly green and heated for procedures to be followed in assessing these types of damage.

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout (refer to the CGC Colour Guide). Pale green or immature seeds are taken into account in the evaluation of colour. See *Colour*.

Procedures

1. Prepare and crush the appropriate number of strips from the cleaned sample.
2. A crush is made with one pass of the roller under firm pressure.
3. Determine the percentage of distinctly green seeds. The Canola/Rapeseed Colour Guide may be used to assist in the determination of distinctly green seeds.

Note: A 10-power magnifying lens may be used to confirm whether dark coloured seeds are brown or very dark green.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Canola, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Procedures

Samples considered fireburnt are graded Canola, Sample Canada, Account Fireburnt

Foreign material (FM)

Foreign material in canola includes anything that is not canola, such as stones, ergot, sclerotinia, conspicuous admixture and inconspicuous admixture.

Green

See *Distinctly green.*

Heated (HTD)

Heated refers only to seeds that are distinctly or badly binburnt. Heated seeds may have a heated odour.

Crushed seeds may be
- Black—badly binburnt
- Dark brown- distinctly heated (refer to the CGC canola/rapeseed Heated Colour Guide)
- Light tan
  - light tan seeds without a heated odour are assessed as damaged
  - light tan seeds with a heated odour are assessed as heated
  - light tan seeds in combination with dark brown or black seeds, with or without a heated odour, are assessed as heated

Procedures

1. Prepare and examine the appropriate number of strips from the cleaned sample.
2. A crush is made with one pass of the roller under firm pressure.
3. Examine the crushed seeds for evidence of heating.
4. Where any heated seeds are found in the initial 500 seeds or a heated odour is detected a minimum of 1000 seeds must be analyzed.
5. Determine the percentage of heated seeds. The Canola/Rapeseed Heated Colour Guide may be used to assist in the determination of heated seeds.
6. Heated seeds of other grains are included in the tolerance for *Heated*.

Inconspicuous admixture (INC ADMX)

Inconspicuous admixture is defined as seeds of common wild mustard, domestic oriental mustard, domestic brown mustard, and brown *Brassica carinata* that are not readily distinguishable from canola.

Procedures

To determine the percentage by weight of inconspicuous admixture, analyse the sample with the aid of a microscope.

Insect excreta (I EXCR)

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Canola, Sample Canada, Account Odour*
A distinct heated odour	*Canola, Sample Canada, Account Heated*
A distinct fireburnt odour	*Canola, Sample Canada, Account Fireburnt*

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Classed as sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*

Procedures

See *Damage*.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample. Refer to *Normal cleaning procedures*
2. Soft earth pellets are removed as dockage. See *Composition of dockage*.

Sprouted (SPTD)

Sprouted canola is defined as those seeds having a ruptured seed coat in combination with either a rootlet that protrudes beyond the normal contour of the seed or distinct swelling of the seed. Seeds having a ruptured seed coat that are otherwise sound are only considered sprouted when found in combination with seeds meeting the definition of sprouted.

Procedures

1. Divide the sample to the appropriate representative portion.
2. Handpick the representative portion for sprouted seeds.
3. Determine the percentage by weight.

Note: Sprouted canola is included in "Total Damage" for grade assessment.

Staghead

Staghead or white rust is a fungal disease of canola. It affects the flowering parts of the plant, resulting in distorted antler-like structures that are often covered by white or grey powdery spores. For grading, staghead bodies are considered *Conspicuous admixture*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Canola, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Canola, Sample Canada Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Canola, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Canola, Canada (CAN)

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05

Basic grade:......................... *Canola, No. 2 Canada*
Reason for basic grade:....... 4.0% Distinctly Green

If the above sample contained	Grade in western Canada
0.08% stones	*Canola, Rejected No. 2 Canada Account Stones*
3.0% stones	*Canola, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Canola, Canada (CAN)

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05

Basic grade:......................... *Canola, No. 2 Canada*
Reason for basic grade:....... 4.0% Distinctly Green

If the above sample contained	Grade in eastern Canada
0.08% stones	*Canola, Sample Canada Account Stones*
3.0% stones	*Canola, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Canola, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary grade determinants tables

Canola, Canada (CAN)

Grade name	Standard of quality Degree of soundness	Standard of cleanliness Commercially pure seed
No. 1 Canada	Reasonably well matured, sweet, good natural colour	Not more than 1.0% of other seeds that are conspicuous and that are not readily separable from canola, to be assessed as dockage
No. 2 Canada	Fairly well matured, sweet, reasonably good natural colour	Not more than 1.5% of other seeds that are conspicuous and that are not readily separable from canola, to be assessed as dockage
No. 3 Canada	May have the natural odour associated with low-quality seed, not distinctly sour, musty, rancid, or any odour that would indicate serious deterioration	Not more than 2% of other seeds that are conspicuous and that are not readily separable from canola, to be assessed as dockage
Grade, if No. 3 specs not met		*Canola, Sample Canada Account Admixture*

	Damage			Foreign material included in dockage						
Grade name	**Distinctly green %**	**Heated %**	**Total %**	**Ergot %**	**Excreta %**	**Insect excreta %**	**Sclerotinia %**	**Stones %**	**Total Conspicuous admixture %**	**Inconspicuous admixture %**
No. 1 Canada	2	0.1	5	0.05	0.02	0.10	0.05	0.05	1.0	5
No. 2 Canada	6	0.5	12	0.05	0.02	0.20	0.10	0.05	1.5	5
No. 3 Canada	20	2	25	0.05	0.02	0.3	0.15	0.05	2	5
Grade, if No. 3 specs not met	*Canola, Sample Canada Account Damaged*	*Canola, Sample Canada Account Heated*	*Canola, Sample Canada Account Damaged*	*Canola, Sample Canada Account Ergot*	*Canola, Sample Canada Account Excreta*	*Canola, Sample Canada Account Excreta*	*Canola, Sample Canada Account Admixture*	2.5% or less—*Canola, Rejected (grade) Account Stones*, or *Canola, Sample Canada Account Stones* Over 2.5%—*Canola, Sample Salvage*	*Canola, Sample Canada Account Admixture*	50% or less—*Canola, Sample Canada Account Admixture* Over 50%—*Refuse screenings*

Rapeseed, Canada (CAN)

Grade name	Standard of quality Degree of soundness	Standard of cleanliness Commercially pure seed
No. 1 Canada	Reasonably well matured, sweet, good natural colour	Not more than 1.0% of other seeds that are conspicuous and that are not readily separable from rapeseed
No. 2 Canada	Fairly well matured, sweet, reasonably good natural colour	Not more than 1.5% of other seeds that are conspicuous and that are not readily separable from rapeseed
No. 3 Canada	May have the natural odour associated with low-quality seed, not distinctly sour, musty, rancid, or any odour that would indicate serious deterioration	Not more than 2% of other seeds that are conspicuous and that are not readily separable from rapeseed
Grade, if No. 3 specs not met		*Rapeseed, Sample Canada Account Admixture*

Grade name	Damage			Foreign material include in dockage						Inconspicuous admixture %
	Distinctly green %	Heated %	Total %	Ergot %	Excreta %	Insect excreta %	Sclerotinia %	Stones %	Total Conspicuous admixture %	
No. 1 Canada	2	0.1	5	0.05	0.02	0.10	0.05	0.05	1.0	5
No. 2 Canada	6	0.5	12	0.05	0.02	0.20	0.10	0.05	1.5	5
No. 3 Canada	20	2	25	0.05	0.02	0.3	**0.15**	0.05	2	5
Grade, if No. 3 specs not met	*Rapeseed, Sample Canada Account Damaged*	*Rapeseed, Sample Canada Account Heated*	*Rapeseed Sample Canada Account Damaged*	*Rapeseed, Sample Canada Account Ergot*	*Rapeseed, Sample Canada Account Excreta*	*Rapeseed, Sample Canada Account Excreta*	*Rapeseed, Sample Canada Account Admixture*	2.5% or less— *Rapeseed, Rejected (grade) Account Stones*, or *Rapeseed, Sample Canada Account Stones* Over 2.5% — *Rapeseed, Sample Salvage*	*Rapeseed, Sample Canada Account Admixture*	50% or less— *Rapeseed, Sample Canada Account Admixture* Over 50%—*Refuse screenings*

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean may contain material as follows.

Definition of commercial cleanliness, canola

Grade name	Material other than canola remaining on top of round-hole sieve %		Total net dockage %
	Roughage material such as wild oats, seed pods, knuckles	Total	
No. 1 Canada	0.3	0.5	2.5
No. 2 Canada	0.3	0.5	2.5
No. 3 Canada	0.3	0.5	2.5

Dockage is reported to the nearest
- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

A deduction for broken and reasonably sound canola handpicked from the material and removed as dockage is allowed
- On shipments not for direct export, of up to 0.50%
- On shipments for direct export, of up to 0.75%
- On shipments ex primary elevators, of up to 0.50%

These deductions are applied to determine total net dockage for commercially clean shipments.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean.* Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest
- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

Instead of the allowances for broken seed in commercially clean shipments, a direct deduction of up to 0.2% is applied to establish net dockage for direct shipments only.

Determination of dockage

Follow procedures for normal cleaning, with the Carter dockage tester set up as follows:

Feed control	#3
Air control	#5
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner	Off

You will also need the following hand sieves.

Round-hole sieves	Slotted sieves
No. 5	No. .028
No. 5.5	No. .032
No. 6	
No. 6.5	
No. 7	
No. 7.5	

Composition of dockage

In export grade canola, dockage consists of

- Material other than canola that passes over the No. 000 riddle or remains on top of the round-hole sieve
- Material that passes through the No. 028 or .032 slotted sieve
- Material removed by aspiration
- less the applicable allowance of broken and reasonably sound canola deducted from the slotted and/or aspiration
- *Conspicuous admixture* handpicked from the cleaned sample

Grading

Canola on export is graded in accordance with export specifications. Where there are no export specifications, the primary specifications are used.

Export grade determinants tables

Canola and rapeseed, Canada (CAN)

Grade name	Total removable material %	Damage			Foreign material included in dockage					Inconspicuous admixture %
		Distinctly green %	Heated %	Total %	Ergot %	Insect excreta %	Sclerotinia %	Stones %	Total Conspicuous admixture %	
No. 1 Canada	2.5	2	0.1	5	0.05	0.10	0.05	0.05	1.0	5
No. 2 Canada	2.5	6	0.5	12	0.05	0.20	0.10	0.05	1.5	5
No. 3 Canada	2.5	20	2	25	0.05	0.3	**0.15**	0.05	2	5

11. Flaxseed

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Classes and varieties

Flaxseed

Brown flaxseed applies to varieties with brown seed coats.

Yellow flaxseed applies to varieties with yellow seed coats.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by the following cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after the cleaning assessment has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples graded

- *Flaxseed, Sample CW/CE Account Fireburnt*
- *Flaxseed, Sample Salvage*
- *Flaxseed, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#4
Air control	#3
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner control	Off

2. You need the No. 4.5 round-hole sieve, and one wire sieve, depending on the size of the flaxseed or solin and the nature of the material to be removed.

Round-hole sieves	Wire sieves
No. 4.5	No. 4x14 No. 3x16

3. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.

4. For hand sieving use approximately 250 g per sieving
   1. Sieve each portion over the appropriate wire sieve until maximum cleanout has been achieved.
   2. Handpick seed clusters and return the seeds to the cleaned sample.
   3. Sieve each portion over the No. 4.5 RH sieve until maximum cleanout has been achieved.
5. Combine the separated 250-g portions.
6. Turn on the Carter dockage tester.
7. Pour the entire working sample into the hopper.
8. After the sample has passed through the machine, turn off the machine.
9. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
10. Using a Boerner-type divider, divide not less than 20 g from the cleaned working sample.
11. From the 20-g portion, determine the percentage by weight of inseparable material.
12. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material remaining on top of the wire sieve, except flaxseed clusters and whole flaxseed that are put back into the sample
- Material that passes through the No. 4.5 round-hole sieve
- Material removed by aspiration
- Material that passes over the No. 000 riddle
- Soft earth pellets handpicked from the cleaned sample
- Inseparable material up to established grade tolerances handpicked from the clean sample
- Material removed by *Cleaning for grade improvement*

Primary samples, commercially clean

Primary samples are commercially clean when the net dockage does not exceed 2.5% of the sample weight. Commercially clean primary samples can have up to 0.5% for broken and reasonably sound flaxseed deducted from the gross weight of the dockage.

Primary samples, not commercially clean

In not commercially clean primary samples there is no allowance for broken and reasonably sound flaxseed.

Sample grades

In sample grades, inseparable admixture is not added to dockage. Where the inseparable material exceeds 2.0% of the sample by weight, the admixture becomes a reason for the sample grade and is recorded in remarks.

Rejected account stones

In samples that grade *Rejected (basic grade) Account Stones*, dockage includes inseparable material handpicked from the clean sample up to the tolerance.

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

1. After the cleaning assessment has been completed, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement – Flaxseed* for the list of equipment.
2. Sieve the material by hand or pass it through the Carter dockage tester, depending on the material.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Flaxseed

Material to be removed	Equipment	Effect on composition of dockage
Inseparable material	No. 5 round-hole hand sieve	The material passing through the sieve is included in the dockage. Not more than 5.0% of sound flaxseed may be removed for each single grade improvement achieved.
Lightweight material	Carter dockage tester, with Feed control at #4 and air control at #4.5 **Note:** The material originally removed by aspiration is to be reconstituted back into the sample prior to cleaning for improvement.	The material removed, including damaged seed, is included in the dockage. Not more than 5.0% of sound flaxseed may be removed from the cleaned sample for each single grade improvement achieved.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of flaxseed.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Flaxseed, No. 1 CW
4.0% Barley No. 1 CW
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of flaxseed for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Broken	15	50
Damage (visual)	10	50
Damage (crush)	10	100
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Heated	10	100
Inseparable seeds	5	50
Odour	working sample	working sample
Other classes	15	50
Sclerotinia sclerotiorum	500	working sample
Soft earth pellets	working sample	working sample
Stones	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Broken (BKN)

Broken seeds are pieces of flaxseed that are less than three-quarters the size of a whole seed.

▲ **Important:**

- Flaxseed have separate tolerances for *Broken*.
- Broken seeds of flaxseed are also included in *Total damage*.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Flaxseed, Sample Condemned*.

Damage (DMG)

Damage includes

- Seeds that are heated, broken, frosted, green, sprouted, shriveled or otherwise damaged
- Seeds with fractured seed coats

▲ **Important:** Seeds are not considered damaged if they

- Have any side portions of the boll membrane attached but are otherwise sound
- Appear scabbed or blistered but are otherwise sound

Procedure

1. Divide the sample to the appropriate representative portion.
2. Handpick the representative portion for visually damaged seeds and suspect damaged seeds.
3. Determine the percentage concentration by weight for the visually damaged seeds.
4. The suspect damaged seeds are cut or are placed on a strip of masking tape and crushed with a seed roller to expose the cotyledons. The number of damaged seeds is converted to a weight percentage by weighing an equal number of sound seeds and dividing the weight of the sound seeds by the weight of the representative portion. If any heated seeds are detected or if the sample has a heated odour, refer to the procedure for assessment of heated.
5. Add the two percentages of damage together to determine the total damage.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off-white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Flaxseed, Held IP Suspect Contaminated Grain*.

Fireburnt (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Procedures

Samples considered fireburnt are graded *Flaxseed, Sample CW/CE, Account Fireburnt*.

Heated (HTD)

Heated refers to seeds with discoloured cotyledons ranging in colour from orange to dark brown depending on the severity of heat damage. The seed coats of heated seeds are usually shiny brown or black. Severely heated seeds usually have a heated odour.

Procedure

1. The cleaned sample is divided to a representative portion, depending on the concentration of heated in the sample.
2. Those seeds having shiny brown to black seed coats are separated by hand as potential heated seeds.
3. The potentially heated seeds are cut or are placed on a strip of masking tape and crushed with a seed roller to expose the cotyledons.
4. Seeds having discoloured cotyledons ranging in colour from orange to dark brown are counted to determine the percentage of heated seeds.
5. When crushing samples, the number of heated seeds is converted to a weight percentage by weighing an equal number of sound seeds and dividing the weight of the sound seeds by the weight of the representative portion.
6. Heated seeds of other grains are included in the tolerance for *Heated*

Inseparable seeds (INSEP SDS)

Inseparable seeds are domestic seeds such as mustard seed, canola, whole shrunken or broken kernels of other grains and weed seeds such as wild oats and lady's thumb that remain in the sample after cleaning.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	**Then the grade is . . .**
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Flaxseed, Sample CW/CE Account Odour*
A distinct heated odour	*Flaxseed, Sample CW/CE Account Heated*
A distinct fireburnt odour	*Flaxseed, Sample CW/CE Account Fireburnt*

Other classes of flaxseed (OCL)

- In brown flaxseed, other classes of flaxseed refers to classes with yellow seed coats.
- In yellow flaxseed, other classes of flaxseed refers to classes with brown seed coats.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*
- Any non-toxic material of similar consistency

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets are removed as dockage. See *Composition of dockage*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Flaxseed, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Flaxseed, Sample Canada Eastern Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Flaxseed, Sample Salvage*.

Examples: Western Canada

Primary grade determinant table
Flaxseed, CW/CE

Grade name	Stones %
No. 1 CW	0.05
No. 2 CW	0.05
No. 3 CW	0.05

Basic grade:......................... *Flaxseed, No. 1 CW*

If the above sample contained	Grade in Western Canada
0.08% stones	*Flaxseed, Rejected No. 1 CW Account Stones*
3.0% stones	*Flaxseed, Sample Salvage*

Example : Eastern Canada

Primary grade determinant table
Flaxseed CW/CE

Grade Name	Stones %
No. 1 CE	0.05
No. 2 CE	0.05
No. 3 CE	0.05

Basic grade:......................... *Flaxseed, No. 1 CE*

If the above sample contained	Grade in Eastern Canada
0.08% stones	*Flaxseed, Sample CE Account Stones*
3.0% stones	*Flaxseed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Flaxseed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary grade determinants tables

Flaxseed, Canada Western/Canada Eastern (CW/CE)

Grade name	Standard of quality			Standard of cleanliness Commercially pure seed %
	Minimum test weight kg/hL (g/0.5L)	Variety	Degree of soundness	
No. 1 CW/CE	65 (305)	Any variety of the class Flaxseed, Canada Western / Canada Eastern designated as such by Order of the Commission	Mature and sweet	Not more than 1.0% of other seeds that are not readily separable from flaxseed, to be assessed as dockage
No. 2 CW/CE	62 (290)	Any variety of the class Flaxseed, Canada Western / Canada Eastern designated as such by Order of the Commission	Reasonably well matured and sweet	Not more than 1.5% of other seeds that are not readily separable from flaxseed, to be assessed as dockage
No. 3 CW/CE	No minimum	Any variety of flaxseed	Excluded from higher grades on account of light weight or damaged seeds; may have the natural odour associated with low-quality seed, not distinctly sour, musty, rancid or any odour that would indicate serious deterioration	Not more than 2% of other seeds that are not readily separable from flaxseed, to be assessed as dockage
Grade, if No. 3 specs not met				*Flaxseed, Sample CW/CE Account Admixture*

Grade name	Brown seeded flax	Yellow seeded flax	Damage				Foreign material included in dockage					
	Yellow seeded flax %	Brown seeded flax %	Broken %	Heated %		Total %	Ergot %	Excreta %	Sclerotinia %	Stones %	Inseparable seeds %	Total %
				CW	CE							
No. 1 CW/CE	2	2	12.5	0.05	0.2	12.5	0.05	0.02	0.10	0.05	1.0	1.0
No. 2 CW/CE	3	2	25	0.2	0.5	25	0.05	0.02	0.20	0.05	1.5	1.5
No. 3 CW/CE	4	2	35	10	10	No limit	0.05	0.02	0.25	0.05	2	2
Grade, if No. 3 specs not met	50% or less— *Flaxseed, Sample CW Account Admixture*		50% or less—*Flaxseed, Sample CW/CE Account Broken* Over 50%—*Sample Broken Grain*	*Flaxseed, Sample CW/CE Account Heated*			*Flaxseed, Sample CW/CE Account Ergot*	*Flaxseed, Sample CW/CE Account Excreta*	*Flaxseed, Sample CW/CE Account Admixture*	2.5% or less—*Flaxseed, Rejected (grade) Account Stones* or *Flaxseed, Sample CE Account Stones* Over 2.5%—*Flaxseed, Sample Salvage*	*Flaxseed, Sample CW/CE Account Admixture*	*Flaxseed, Sample CW/CE Account Admixture*

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments are defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Dockage is reported to the nearest
- 0.1% for samples representing commercially clean shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

A deduction for broken and reasonably sound flaxseed handpicked from the material and removed as dockage is allowed
- On shipments not for direct export, of up to 0.50%
- On shipments for direct export, of up to 0.75%

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean.* Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest
- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

Instead of the allowances for broken seed in commercially clean shipments, a direct deduction of up to 0.2% is applied to establish net dockage for direct shipments only.

Determination of dockage

Follow procedures for normal cleaning, with the Carter dockage tester set up as follows.

	"CCLN"	"NCC"
Feed control	#3	#4
Air control	#2	#3
Riddle	None	None
Top sieve	Blank tray	Blank tray
Centre sieve	None	None
Bottom sieve	None	None
Sieve cleaner	Off	Off

You will also need the following hand sieves.

Round-hole sieves	Wire sieves
No. 4.5	No. 4x14
	No. 3x16

Composition of dockage

In export grade flaxseed, dockage consists of

- Material that remains on top of the wire sieve
- Material that passes through the No. 4.5 round-hole hand sieve, less the applicable allowance of broken and reasonably sound flaxseed
- Material removed by aspiration
- Inseparable material up to established grade tolerances, handpicked from the cleaned sample

Grading

Flaxseed on export is graded in accordance with export specifications.
Where there are no export specifications the primary specifications are used.

Export grade determinants tables

Flaxseed, Canada Western/Canada Eastern (CW/CE)

Grade name	Total removable material %	Foreign material included in dockage				Brown seeded flax	Yellow seeded flax	Damage		
		Ergot %	Sclerotinia %	Stones %	Total including inseparable seeds %	Yellow seeded flaxseed %	Brown seeded flaxseed %	Broken %	Heated %	Total %
No. 1 CW/CE	2.5	0.05	0.10	0.05	1.0	2	2	12.5	0.05	12.5
No. 2 CW/CE	2.5	0.05	0.20	0.05	1.5	3	2	25	0.2	25
No. 3 CW/CE	2.5	0.05	0.25	0.05	2	4	2	35	10	No limit within broken and heated tolerances

12. Domestic mustard seed

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Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Yellow Account Heated.*

Identifying classes of domestic mustard seed

Class	Colour	Approximate size	Shape	Surface
Yellow	Light creamy-yellow to yellow Occasional seed is light or yellowish brown	2 to 3 mm in diameter	Spherical or oval	Textured, similar to an orange peel, hilum area– small white spot on a deep yellow to light tan circular area
Brown	Reddish-brown to dark-brown	2 mm or less in diameter	Spherical or oval	Predominant netting, ridges are thicker than oriental mustard, hilum area – white on a black or darker brown circular area
Oriental	Predominantly yellow to dark-yellow, with some seeds ranging from light brown to brown	1.2 to 2.0 mm in width, 1.6 to 3.0 in length	Oval	Predominant netting, not as predominant as brown mustard, ridges are fine, hilum area – white on a darker yellow to lighter brown circular area
Mixed	Yellow and brown mustard seed containing less than 90.0% of one class See also *Domestic mustard seed, oriental: Other classes*			

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after the cleaning assessment has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Domestic Mustard Seed, Sample Canada (class) Account Fireburnt*
- *Domestic Mustard Seed, Sample Salvage*
- *Domestic Mustard Seed, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#3
Air control	#7
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	none
Bottom sieve	none
Sieve cleaner control	off

2. You also need the following hand sieves:

Round-hole hand sieves	Slotted hand sieves
No. 5.5	No. .028
No. 6	No. .032
No. 6.5	No. .035
No. 7	No. .038
No. 7.5	No. .040

3. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
4. For hand sieving use approximately 250 g.

▲ **Important:**

- Ensure you start with the right sized sieves.
- When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre to one side, to the other side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.
  1. Use whichever round-hole sieve will achieve maximum removal of large material with minimum loss of domestic mustard seed.
  2. Use whichever slotted sieve will achieve maximum removal of weed seeds with minimum loss of domestic mustard seed.

5. Combine the separated, cleaned 250-g portions.
6. Turn on the Carter dockage tester.
7. Pour the sample into the hopper.
8. After the sample has passed through the machine, turn off the machine.
   - Reduce the air setting to #5 if there is a large loss of whole, reasonably sound seed.
   - If the sample after normal cleaning with air control at #7 qualifies only for *Sample* grade, you must start all over again. Recombine the sample with whatever dockage material has been removed. Re-assess dockage with the appropriate sieves and the air control set at #5.
9. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- Material remaining on top of the round-hole hand sieve
- Material passing through the slotted hand sieve
- Material passing over the No. 000 riddle
- Material removed by aspiration
- Material removed by *Cleaning for grade improvement*

Primary samples, commercially clean

Commercially clean primary samples can have up to 0.5% for broken and reasonably sound mustard seed deducted from the gross weight of the dockage. *Primary samples are considered commercially clean when the net dockage does not exceed 2.5% of the sample weight.*

Primary samples, not commercially clean

In not commercially clean primary samples, there is no allowance for broken and reasonably sound mustard seed. All the material removed by the slotted sieve is assessed as dockage.

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

Carter dockage tester

1. After the cleaning assessment has been completed, examine the material to be removed and select your equipment according to the material you want to remove. See the table *Cleaning for grade improvement — domestic mustard seed.*
2. Pass the sample through the Carter dockage tester.
3. Weigh the additional dockage and add it to the original dockage.

Spiral cleaner— for yellow mustard seed and only upon request

Operating procedures

1. The sample to be cleaned by the spiral is the net sample remaining after normal cleaning procedures.
2. Pour the sample into the feed hopper at the top of the spiral. Once the sample has passed through the spiral, lightly tap it to remove any lodged seeds remaining on the flights..
3. Collect the seeds that have discharged from the bottom spout (spout closest to the core of the cleaner)
4. Determine the percentage by weight of the seeds that have discharged and determine if more than 5.0% of yellow mustard has been removed per grade improvement.

Reporting procedures

1. Where the grade is not improved or more than 5.0% of domestic mustard is removed for each grade improvement, the grade and dockage will not be revised.
2. Where the grade can be improved while removing 5.0% or less of domestic mustard for each grade improvement, the certificate will state only the grade and dockage achieved through use of the spiral cleaner or Carter dockage tester.

Cleaning for grade improvement—domestic mustard seed

Material to be removed	Equipment		Effect on composition of dockage
Excessive inseparable weed seeds or damaged mustard seeds for yellow mustard seed **Note:** The material originally removed by aspiration is to be reconstituted back into the sample prior to cleaning for improvement.	Spiral cleaner—on request, for yellow mustard seed only		Not more than 5.0% of domestic mustard seed may be removed for each grade improvement achieved.
	Carter dockage tester set as follows:		
	Feed control	#3	
	Air control	#7	
	Riddle	No. 000	
	Top sieve	No. 4.5 or No. 5 round-hole	
	Centre sieve	blank tray	
	Bottom sieve	none	
	Sieve cleaner control	off	
Excessive inseparable weed seeds or damaged mustard seeds for brown and oriental mustard seed **Note:** The material originally removed by aspiration is to be reconstituted back into the sample prior to cleaning for improvement.	Carter dockage tester set as follows:		Not more than 5.0% of domestic mustard seed may be removed for each grade improvement achieved.
	Feed control	#3	
	Air control	#7	
	Riddle	No. 000	
	Top sieve	No. 4.5 or No. 5 round-hole	
	Centre sieve	blank tray	
	Bottom sieve	none	
	Sieve cleaner control	off	
Canola or wild mustard in yellow mustard seed	Carter dockage tester set as follows:		The material passing through the sieve is included in the dockage. Not more than 5.0% of domestic mustard seed may be removed for each grade improvement achieved.
	Feed control	#3	
	Air control	off	
	Riddle	No. 000	
	Top sieve	none	
	Centre sieve	No. 4.5 or No. 5 round-hole	
	Bottom sieve	blank tray	
	Sieve cleaner control	off	

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of mustard.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Domestic Mustard Seed, No. 1 CAN Yellow
4.0% Rye, No. 2 CW
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. For grading, percentages by weight refer to percentages of the net weight.

Kernel counts (K)

A kernel count is the number of kernel-sized pieces in a 500 g sample.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Crush

A crush is one pass of the roller under firm pressure over a seed stick on masking tape.

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Grading—Domestic Mustard Seed, Brown

Representative portion of domestic mustard seed, brown for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Canola	5	25
Cockle	5	50
Colour	working sample	working sample
Conspicuous admixtures	5	50
Damage	5	25
Distinctly detrimental	5	50
Distinctly green	500 seeds	1000 seeds
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Heated	500 seeds	1000 seeds
Inconspicuous admixture	5	25
Odour	working sample	working sample
Other classes	5	25
Rime	5	25
Sclerotinia sclerotiorum	100	500
Soft earth pellets	working sample	working sample
Stones	working sample	working sample
Treated Seed	working sample	working sample
Wild mustard seed	5	25

Grading factors

Canola (CNL)

In brown mustard, canola is classed as *Inconspicuous admixture*.

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Brown, Account Heated*. For a description of classes, see *Identifying classes of domestic mustard seed*.

Cockle (COC)

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In brown mustard, cockle is part of *Conspicuous admixture*.

Procedures

Use a microscope to examine the sample.

Colour (CLR)

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green*.
- The amount of rime—light rime is considered in the overall appearance of the sample. See *Damage*.

Conspicuous admixture (CADMX)

Conspicuous admixture is also called *Conspicuous inseparable seeds* in the grade determinants tables. In brown mustard, conspicuous admixture includes

- Small seeds or broken seeds of other grains
- Weed seeds such as cow cockle, lamb's-quarters, ball mustard, pigweed, cleavers, smartweed and lady's-thumb.
- Any conspicuous foreign material except stones and soft earth pellets

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed, Sample Canada Brown Condemned.*

Damage (DMG)

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured from mould
- Completely and densely covered with rime
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining.
   A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add the percentage of visually damaged seeds and crushed seeds for *Total damage*.

Distinctly detrimental (DDET)

Admixtures considered distinctly detrimental include

- Cow cockle
- Sclerotinia

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See *Colour*.

Procedures

See Damage.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Procedures

- If the amount of excreta is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
    - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
    - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Brown Account Fertilizer Pellets*.
    - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain*.

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Brown Account Fertilizer Pellets*. If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Fireburnt kernels (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Procedures

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada Brown Account Fireburnt.*

Frost

See *Damage.*

Green

See *Distinctly green.*

Heated kernels (HTD)

Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be

- Black—badly binburnt
- Dark chocloate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage.*
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.
4. Heated seeds of other grains are included in the tolerance for *Heated.*

Inconspicuous admixture (INC ADMX)

In brown mustard seed, inconspicuous admixture includes

- Canola
- Common wild mustard seed
- Any other seeds that blend with brown mustard seed and are not readily identified

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Mixed classes (MXD CL)

Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. See *Other classes.*

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	**Then the grade is . . .**
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Domestic Mustard Seed, Sample Canada Brown, Account Odour*
A distinct heated odour	*Domestic Mustard Seed, Sample Canada Brown, Account Heated*
A distinct fireburnt odour	*Domestic Mustard Seed, Sample Canada Brown, Account Fireburnt*

Other classes (OCL)

In brown mustard seed, other classes are yellow and oriental mustard seed and Brassica Carinata.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard Seed, No. 1 Canada Mixed*.

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime, with the exception of the hilum, are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Classed as sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only— if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Sprouted (SPTD)

Sprouted mustard is defined as those seeds having a ruptured seed coat in combination with either a rootlet that protrudes beyond the normal contour of the seed or distinct swelling of the seed. Seeds having a ruptured seed coat that are otherwise sound are only considered sprouted when found in combination with seeds meeting the definition of sprouted.

Procedures

1. Divide the sample to the appropriate representative portion.
2. Handpick the representative portion for sprouted seeds.
3. Determine the percentage by weight.

Note: Sprouted mustard is included in "Total Damage" for grade assessment.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets*.

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Brown Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Brown, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:......................... *Domestic Mustard Seed,*
No. 2 Canada Brown
Reason for basic grade:....... 2.0% Distinctly green

If the above sample contained	Grade in western Canada
0.08% stones	*Domestic Mustard Seed,* *Rejected No. 2 Canada Brown Account Stones*
1.0% stones	*Domestic Mustard Seed,* *Rejected No. 2 Canada Brown Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Brown, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:......................... *Domestic Mustard Seed,*
No. 2 Canada Brown
Reason for basic grade:....... 2.0% Distinctly green

If the above sample contained	Grade in eastern Canada
0.08% stones	*Domestic Mustard Seed, No. 4 Canada Brown*
1.0% stones	*Domestic Mustard Seed,* *Sample Canada Brown Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety (VAR)

Domestic mustard seed is graded without reference to variety.

Wild mustard (WM)

Wild mustard seeds are classed as *Inconspicuous admixture.*

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Brown, Canada (CAN)

Grade name	Standard of quality		Damage		
	Degree of soundness	Other classes %	Distinctly green %	Heated %	Total %
No. 1 Canada	Reasonably well matured, sweet, good natural colour	0.5	1.5	0.10	1.5
No. 2 Canada	Fairly well matured, sweet, reasonably good colour	2	2.0	0.20	3
No. 3 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	5	**3.5**	0.5	5
No. 4 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	10	**3.5**	1	10
Grade, if No. 4 specs not met		Over 10%—use all other grading criteria and grade as *Domestic Mustard Seed (grade) Mixed*	*Domestic Mustard Seed, Sample Canada Brown Account Damaged*	*Domestic Mustard Seed, Sample Canada Brown Account Heated*	*Domestic Mustard Seed, Sample Canada Brown Account Damaged*

Grade name	Inconspicuous admixture %	Conspicuous inseparable seeds				Ergot %	Excreta %	Soft earth pellets %	Stones %
		Distinctly detrimental			Total %				
		Cow cockle %	Sclerotinia %	Total distinctly detrimental %					
No. 1 Canada	1.0	0.10	0.10	0.10	0.3	0.05	1 K	0.01	0.05
No. 2 Canada	1.0	0.20	0.20	0.20	0.5	0.05	1 K	0.20	0.05
No. 3 Canada	1.0	0.3	0.3	0.3	0.7	0.05	1 K	0.3	0.05
No. 4 Canada	1	1	1	1	3	0.05	0.005	1	0.1
Grade, if No. 4 specs not met	*Domestic Mustard Seed, Sample Canada Brown Account Admixture*					*Domestic Mustard Seed, Sample Canada Brown Account Ergot*	*Domestic Mustard Seed, Sample Canada Brown Account Excreta*	*Domestic Mustard Seed, Sample Canada Brown Account Admixture*	2.5% or less—*Domestic Mustard Seed, Rejected (grade) Brown Account Stones*, or *Domestic Mustard Seed, Sample Canada Brown Account Stones* Over 2.5%—*Domestic Mustard Seed, Sample Salvage*

K Number of kernel-sized pieces in 500 g

Note: The class, whether yellow, oriental, brown or mixed, is added to the grade name.

Grading—Domestic Mustard Seed, Oriental

Representative portion of domestic mustard seed, oriental for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Blotched seeds	5	25
Canola	5	25
Cockle	5	50
Colour	working sample	working sample
Conspicuous admixture	5	50
Damage	5	25
Distinctly detrimental	5	50
Distinctly green	500 seeds	1000 seeds
Ergot	working sample	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Heated	500 seeds	1000 seeds
Inconspicuous admixture	5	25
Odour	working sample	working sample
Other classes	5	25
Rime	5	25
Sclerotinia sclerotiorum	100	500
Soft earth pellets	working sample	working sample
Stones	working sample	working sample
Treated Seed	working sample	working sample
Wild mustard seed	5	25

Grading factors

Blotched seeds

Blotched seeds are oriental mustard seeds with black or brown discolourations on the seed coat.

- Seeds only partly discoloured but otherwise sound are considered sound, but the discolouration is taken into account in the evaluation of colour. See *Colour.*
- Seeds completely discoloured by blotch are considered damaged. See *Damage.*

Canola (CNL)

In oriental mustard, canola is classed as *Inconspicuous admixture.*

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Oriental, Account Heated.* For a description of classes, see *Identifying classes of domestic mustard seed.*

Cockle (COC)

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In oriental mustard, cockle is part of *Conspicuous admixture.*

Procedures

Use a microscope to examine the sample.

Colour (CLR)

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green.*
- The amount of rime—light rime is considered in the overall appearance of the sample. See *Damage.*

Conspicuous admixture (CADMX)

Conspicuous admixture is called *Conspicuous inseparable seeds* in the grade determinants tables. In oriental mustard, conspicuous admixture includes

- Small seeds or broken seeds of other grains
- Weed seeds such as cow cockle, lamb's-quarters, ball mustard, pigweed, cleavers, smartweed and lady's-thumb.
- Any conspicuous foreign material except stones and soft earth pellets

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed, Sample Canada Oriental Condemned.*

Damage (DMG)

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured by mould
- Completely discoloured by blotch
- Completely and densely covered with rime
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining.
   A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add the percentage of visually damaged seeds and crushed seeds for *Total damage.*

Distinctly detrimental (DDET)

Admixtures considered distinctly detrimental include

- Cow cockle
- Sclerotinia

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation ofcolour. See *Colour*.

Procedures

See *Damage*.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Procedures

- If the amount of excreta is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
  - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
  - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Oriental Account Fertilizer Pellets*.
  - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain.*

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Oriental Account Fertilizer Pellets*. If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Fireburnt kernels (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Procedures

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada Oriental Account Fireburnt.*

Frost

See *Damage*.

Green

See *Distinctly green.*

Heated kernels (HTD)

Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be
- Black—badly binburnt
- Dark chocolate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage*.
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.
4. Heated seeds of other grains are included in the tolerance for *Heated*.

Inconspicuous admixture (INC ADMX)

In oriental mustard seed, inconspicuous admixture includes
- Canola
- Common wild mustard seed
- Any other seeds that blend with oriental mustard seed and are not readily identified

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of anlayses are confirmed by seed analysts.

Mixed classes (MXD CL)

Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. See *Other classes*.

Odour (ODOR)

There is no numeric tolerance for odour. Consider
- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Domestic Mustard Seed,Sample Canada Oriental, Account Odour*
A distinct heated odour	*Domestic Mustard Seed, Sample Canada Oriental, Account Heated*
A distinct fireburnt odour	*Domestic Mustard Seed, Sample Canada Oriental, Account Fireburnt*

Other classes (OCL)

Other classes of domestic mustard seed in oriental mustard seed are yellow and brown mustard or Brassica Carinata.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard Seed, No. 1 Canada Mixed*.

Other class	Tolerance
Brown mustard or Brown Brassica Carinata	Working tolerance for seeds with brown hulls • For Canada No. 1 Oriental, 2.0% • For Canada No. 2, 3, 4 Oriental, 5.0%
Yellow mustard or Yellow Brassica Carinata	Considered *Mixed* if sample contains more than 10.0% of yellow mustard seed

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Considered sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Sprouted (SPTD)

Sprouted mustard is defined as those seeds having a ruptured seed coat in combination with either a rootlet that protrudes beyond the normal contour of the seed or distinct swelling of the seed. Seeds having a ruptured seed coat that are otherwise sound are only considered sprouted when found in combination with seeds meeting the definition of sprouted.

Procedures

1. Divide the sample to the appropriate representative portion.
2. Handpick the representative portion for sprouted seeds.
3. Determine the percentage by weight.

Note: Sprouted mustard is included in "Total Damage" for grade assessment.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets*.

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Oriental Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Oriental, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:......................... *Domestic Mustard Seed,*
No. 2 Canada Oriental
Reason for basic grade:....... 2.0% Damage

If the above sample contained	Grade in western Canada
0.08% stones	*Domestic Mustard Seed,* *Rejected No. 2 Canada Oriental Account Stones*
1.0% stones	*Domestic Mustard Seed,* *Rejected No. 2 Canada Oriental Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Oriental, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:......................... *Domestic Mustard Seed,*
No. 2 Canada Oriental
Reason for basic grade:....... 2.0% Damage

If the above sample contained	Grade in eastern Canada
0.08% stones	*Domestic Mustard Seed, No. 4 Canada Oriental*
1.0% stones	*Domestic Mustard Seed,* *Sample Canada Oriental Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Sample Canada Oriental Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety (VAR)

Domestic mustard seed is graded without reference to variety.

Wild mustard (WM)

Wild mustard seeds are classed as *Inconspicuous admixture*.

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Oriental, Canada (CAN)

Grade name	Standard of quality		Damage		
	Degree of soundness	Other classes % (*)	Distinctly green %	Heated %	Total %
No. 1 Canada	Reasonably well matured, sweet, good natural colour	0.5	1.5	0.10	1.5
No. 2 Canada	Fairly well matured, sweet, reasonably good colour	2	1.5	0.20	3
No. 3 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	5	**3.5**	0.5	5
No. 4 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	10	**3.5**	1	10
Grade, if No. 4 specs not met		Over 10%—use all other grading criteria and grade as *Domestic Mustard Seed (grade) Mixed*	*Domestic Mustard Seed, Sample Canada Oriental Account Damaged*	*Domestic Mustard Seed, Sample Canada Oriental Account Heated*	*Domestic Mustard Seed, Sample Canada Oriental Account Damaged*

Grade name	Inconspicuous admixture %	Conspicuous inseparable seeds				Ergot %	Excreta %	Soft earth pellets %	Stones %
		Distinctly detrimental			Total %				
		Cow cockle %	Sclerotinia %	Total distinctly detrimental %					
No. 1 Canada	0.5	0.10	0.10	0.10	0.3	0.05	1 K	0.01	0.05
No. 2 Canada	1.0	0.20	0.20	0.20	0.5	0.05	1 K	0.20	0.05
No. 3 Canada	1.0	0.3	0.3	0.3	0.7	0.05	1 K	0.3	0.05
No. 4 Canada	1	1	1	1	3	0.05	0.005	1	0.1
Grade, if No. 4 specs not met	*Domestic Mustard Seed, Sample Canada Oriental Account Admixture*					*Domestic Mustard Seed, Sample Canada Oriental Account Ergot*	*Domestic Mustard Seed, Sample Canada Oriental Account Excreta*	*Domestic Mustard Seed, Sample Canada Oriental Account Admixture*	2.5% or less—*Domestic Mustard Seed, Rejected (grade) Oriental Account Stones*, or *Domestic Mustard Seed, Sample Canada Oriental Account Stones* Over 2.5%—*Domestic Mustard Seed, Sample Salvage*

K Number of kernel-sized pieces in 500 g (*) See working tolerance for "Other Classes"

Note: The class, whether yellow, oriental, brown or mixed, is added to the grade name.

Grading—Domestic Mustard Seed, Yellow

Representative portion of domestic mustard seed, yellow for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Canola	5	25
Cockle	5	50
Colour	working sample	working sample
Conspicuous admixture	5	50
Damage	5	25
Distinctly detrimental	5	50
Distinctly green	500 seeds	1000 seeds
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Heated	500 seeds	1000 seeds
Odour	working sample	working sample
Other classes	5	25
Other distinctly detrimental seeds	5	25
Rime	5	25
Sclerotinia sclerotiorum	100	500
Soft earth pellets	working sample	working sample
Stones	working sample	working sample
Treated seed	working sample	working sample
Wild mustard seed	5	25

Grading factors

Canola (CNL)

In yellow mustard seed, canola is classed as *Distinctly detrimental.*

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Classes

Domestic mustard seed is classed as yellow, brown or oriental, or mixed. The class forms part of the grade name; for example, *Domestic Mustard Seed, Sample Canada Yellow, Account Heated.* For a description of classes, see *Identifying classes of domestic mustard seed*

Cockle (COC)

Cockle, or cow cockle, is a hard roundish seed with a dull surface covered with numerous small bumps giving the seed a rough spiky appearance. Colour can be deep black, bluish-black or orangish-brown. In yellow mustard seed, cockle is considered *Distinctly detrimental* and included in *Total conspicuous inseparable seeds.*

Procedures

Use a microscope to examine the sample.

Colour (CLR)

In analysing colour, consider

- The general degree of maturity
- The amount and degree of discolouration, such as from weathering
- The proportion of damaged seeds, which are distinctly green or otherwise colour-damaged. See *Damage* and *Distinctly green.*
- The amount of dried white mucilage on yellow mustard seed—light or sparse mucilage is considered in the overall appearance of the sample. See *Damage.*

Conspicuous admixture (CADMX)

Conspicuous admixture is called *Conspicuous inseparable seeds* in the grade determinants tables. In yellow mustard seed, conspicuous admixture includes

- Seeds and foreign material designated as distinctly detrimental. See *Distinctly detrimental*
- Small seeds and broken kernels of other grains
- Weed seeds such as pigweed, lady's-thumb, lamb's-quarters and smartweed
- Any conspicuous foreign material except stones and soft earth pellets

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of anlayses are confirmed by seed analysts.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Domestic Mustard Seed, Sample Canada Yellow Condemned*.

Damage (DMG)

Damaged seeds include those that are

- Distinctly shrunken or shrivelled
- Badly discoloured from mould
- Completely and densely covered with rime or dried white mucilage. See *Colour*.
- Excessively weathered, sprouted, distinctly green, heated or otherwise damaged

Procedures

1. Handpick the representative portion to determine the content of visually damaged seeds.
2. Determine the percentage by weight.
3. Crush the appropriate number of strips from the portion remaining. A crush is made with only one pass of the roller under firm pressure.
4. Convert the count of damaged seeds on the strip to percentage by weight. Add this percentage of visually damaged seeds and crushed seeds for *Total damage*.

Distinctly detrimental (DDET)

Admixtures considered distinctly detrimental in yellow mustard seed include

- Cow cockle
- Sclerotinia
- Wild mustard, canola/rapeseed
- Other distinctly detrimental seeds (see *Other distinctly detrimental seeds*)
    - Ball mustard
    - Cleavers
    - Cockle
    - Dog mustard
    - Hare's ear mustard
    - Stinkweed or pennycress
    - Tansy mustard
    - Tumbling mustard
    - Wild buckwheat
    - Wormseed mustard

There are separate distinctly detrimental tolerances for cow cockle, sclerotinia and wild mustard in combination with canola or rapeseed and other distinctly detrimental seeds. All listed are included in the total of distinctly detrimental and total of conspicuous inseparable seeds.

Distinctly green (DGR)

Distinctly green tolerances are applied to crushed seeds which are a distinct green throughout. Pale green or immature seeds are taken into account in the evaluation of colour. See *Colour*.

Procedures

See *Damage*.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Procedures

- If the amount of excreta is not excessive, determine the kernel count.
- If the kernel count is excessive, determine the weight of excreta as a percentage of the net weight of the sample.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are considered as a separate grading factor in all grades of domestic mustard seed.
  - Grades of domestic mustard seed may contain one fertilizer pellet in 1000 g, including samples of commercially clean mustard seed.
  - Samples containing one fertilizer pellet per 500 g up to 1.0% are graded *Domestic Mustard Seed, Sample Canada Yellow Account Fertilizer Pellets.*
  - Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Domestic Mustard Seed, Held IP Suspect Contaminated Grain.*

Important: For samples between 500 and 1000 g – if the sample contains one fertilizer pellet, the sample grades *Domestic Mustard Seed, Sample Canada Yellow Account Fertilizer Pellets.* If the sample contains no fertilizer pellets, it is considered to be within the grade tolerance.

Fireburnt kernels (FBNT)

Samples that show any evidence of being charred or scorched by fire are considered fireburnt. Evidence includes odour, pieces of charred wood, and so on. Fireburnt seeds pop when crushed.

Procedures

Samples considered fireburnt are graded *Domestic Mustard Seed, Sample Canada Yellow Account Fireburnt.*

Frost

See *Damage.*

Green

See *Distinctly green.*

Heated kernels (HTD)

Heated refers only to seeds that are distinctly heated or badly binburnt. Heated seeds have a heated odour.

Crushed seeds may be
- Black—badly binburnt
- Dark chocloate brown—distinctly heated
- Light tan—slightly damaged from oxidation. If they have an odour or are present with brown or black crushed seeds, they are considered heated. Otherwise, they are included in *Total damage*, not heated.

Procedures

1. Examine 5 crushes for evidence of heating.
2. If no heated seeds detected, assess crushes for other damage. See *Damage*.
3. If at least 1 heated seed is detected, crush and assess an additional 5 crushes for heated seeds.
4. Heated seeds of other grains are included in the tolerance for *Heated*.

Mixed classes (MXD CL)

Samples are designated mixed classes when they contain sufficient quantities of other classes of mustard seed. See *Other classes*.

Odour (ODOR)

There is no numeric tolerance for odour. Consider
- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	**Then the grade is . . .**
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Domestic Mustard Seed,Sample Canada Yellow, Account Odour*
A distinct heated odour	*Domestic Mustard Seed, Sample Canada Yellow, Account Heated*
A distinct fireburnt odour	*Domestic Mustard Seed, Sample Canada Yellow, Account Fireburnt*

Other classes (OCL)

Other classes of domestic mustard seed in yellow mustard seed are brown and oriental mustard seed and brown or yellow coloured Brassica Carinata.

If a sample contains more than 10.0% other classes, it is designated *Mixed*. Mixed mustard seed is graded according to all specifications except other classes, as in *Mustard seed, No. 1 Canada Mixed*.

Other distinctly detrimental seeds (ODDET)

In yellow domestic mustard seed, the seeds listed below are considered *Other distinctly detrimental seeds*.

Ball mustard
Cleavers
Cockle
Dog mustard
Hare's ear mustard
Stinkweed or pennycress
Tansy mustard
Tumbling mustard
Wild buckwheat
Wormseed mustard

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analysis are confirmed by seed analysts.

Rime

Rime is the lining of the pod adhered to the seed. Seeds that are completely and densely covered with white rime are classed as damaged in any grade. Seeds with light rime sparsely covering the seed coat are

- Classed as sound if not otherwise damaged
- Considered in the evaluation of colour. See *Colour*.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Soft earth pellets (EP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only—if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

▲ **Important:** In domestic mustard seed, fertilizer pellets are not considered soft earth pellets. See *Fertilizer pellets*.

Sprouted (SPTD)

Sprouted mustard is defined as those seeds having a ruptured seed coat in combination with either a rootlet that protrudes beyond the normal contour of the seed or distinct swelling of the seed. Seeds having a ruptured seed coat that are otherwise sound are only considered sprouted when found in combination with seeds meeting the definition of sprouted.

Procedures

1. Divide the sample to the appropriate representative portion.
2. Handpick the representative portion for sprouted seeds.
3. Determine the percentage by weight.

Note: Sprouted mustard is included in "Total Damage" for grade assessment.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency.

Note: Fertilizer pellets are **not** assessed as stones in samples of Domestic Mustard Seed. See *Fertilizer pellets.*

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Domestic Mustard Seed, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Domestic Mustard Seed, Sample Canada Yellow Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Domestic Mustard Seed, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Yellow, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:......................... *Domestic Mustard Seed, No. 2 Canada Yellow*

Reason for basic grade:....... 2.0% Heated

If the above sample contained	Grade in western Canada
0.08% stones	*Domestic Mustard Seed, Rejected No. 2 Canada Yellow Account Stones*
1.0% stones	*Domestic Mustard Seed, Rejected No. 2 Canada Yellow Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Domestic Mustard Seed, Yellow, Canada

Grade name	Stones %
No. 1 Canada	0.05
No. 2 Canada	0.05
No. 3 Canada	0.05
No. 4 Canada	0.10

Basic grade:......................... *Domestic Mustard Seed, No. 2 Canada Yellow*

Reason for basic grade:....... 2.0% Heated

If the above sample contained	Grade in eastern Canada
0.08% stones	*Domestic Mustard Seed No. 4 Canada Yellow*
1.0% stones	*Domestic Mustard Seed, Sample Canada Yellow Account Stones*
3.0% stones	*Domestic Mustard Seed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Domestic Mustard Seed, Sample Canada Yellow Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety (VAR)

Domestic mustard seed is graded without reference to variety.

Wild mustard (WM)

In yellow mustard, wild mustard seeds are classed as *Distinctly detrimental.*

▲ **Important:** Grain inspectors are authorized to withhold grades on samples with unidentifiable admixtures until results of analyses are confirmed by seed analysts.

Primary and export grade determinants tables

Domestic Mustard Seed, Yellow, Canada (CAN)

Grade name	Standard of quality		Damage		
	Degree of soundness	Other classes %	Distinctly green %	Heated %	Total %
No. 1 Canada	Reasonably well matured, sweet, good natural colour	0.5	1.5	0.10	1.5
No. 2 Canada	Fairly well matured, sweet, reasonably good colour	2	1.5	0.20	3
No. 3 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	5	3.5	0.5	5
No. 4 Canada	May have the natural odour associated with low-quality seed not any odour that would indicate serious deterioration	10	3.5	1	10
Grade, if No. 4 specs not met		Over 10%—use all other grading criteria and grade as *Domestic Mustard Seed (grade) Mixed*	*Domestic Mustard Seed, Sample Canada Yellow Account Damaged*	*Domestic Mustard Seed, Sample Canada Yellow Account Heated*	*Domestic Mustard Seed, Sample Canada Yellow Account Damaged*

Grade name	Conspicuous inseparable seeds						Ergot %	Excreta %	Soft earth pellets %	Stones %
	Distinctly detrimental					Total %				
	Cow cockle %	Sclerotinia %	Wild mustard, canola/ rapeseed %	Other distinctly detrimental %	Total distinctly detrimental %					
No. 1 Canada	0.10	0.10	0.10	0.10	0.10	0.3	0.05	1 K	0.01	0.05
No. 2 Canada	0.20	0.20	0.20	0.20	0.20	0.5	0.05	1 K	0.20	0.05
No. 3 Canada	0.3	0.3	0.3	0.3	0.3	0.7	0.05	1 K	0.3	0.05
No. 4 Canada	1	1	1	1	1	3	0.05	0.005	1	0.1
Grade, if No. 4 specs not met	*Domestic Mustard Seed, Sample Canada Yellow Account Admixture*						*Domestic Mustard Seed, Sample Canada Yellow Account Ergot*	*Domestic Mustard Seed, Sample Canada Yellow Account Excreta*	*Domestic Mustard Seed, Sample Canada Yellow Account Admixture*	2.5% or less—*Domestic Mustard Seed, Rejected (grade) Yellow Account Stones*, or *Domestic Mustard Seed, Sample Canada Yellow Account Stones* Over 2.5%—*Domestic Mustard Seed, Sample Salvage*

K Number of kernel-sized pieces in 500 g

Note: The class, whether yellow, oriental, brown or mixed, is added to the grade name.

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

A deduction for broken and reasonably sound mustard seed handpicked from the material and removed as dockage is allowed

- On shipments not for direct export, of up to 0.50%
- On shipments for direct export, of up to 0.75%
- On shipments ex primary elevators, of up to 0.50%

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

Instead of the allowances for broken seed in commercially clean shipments, a direct deduction of up to 0.2% is applied to establish net dockage for direct shipments only.

Determination of dockage

Follow procedures for normal cleaning, with the Carter dockage tester set up as follows.

Setting	Export
Feed control	#3
Air control	#5
Riddle	No. 000
Top sieve	Blank tray
Centre sieve	None
Bottom sieve	None
Sieve cleaner control	Off

You will also need the following hand sieves.

Round-hole hand sieves	Slotted hand sieves
No. 5.5	No. .028
No. 6	No. .032
No. 6.5	
No. 7	
No. 7.5	

Composition of dockage

In export domestic mustard seed shipments, dockage consists of

- Material other than mustard which passes over the No. 000 riddle or remains ontop of the round-hole sieve
- Material that passes through the No. .028 or No. .032 slotted hand sieve, less the applicable allowance for broken or reasonably sound small whole mustard seed
- Material removed by aspiration

Grading

Domestic mustard seed on export is graded in accordance with export specifications. Where there are no export specifications, the primary specifications are used.

13. Buckwheat

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Determining the size of buckwheat

1. Using a Boerner-type divider, divide a representative portion of approximately 250 g from the cleaned sample.
2. Set up the Carter dockage tester as follows.

Feed control	#6
Air control	Off
Riddle	None
Top sieve	No. 8 slotted
Centre sieve	Blank tray
Bottom sieve	None
Sieve cleaner control	Off

3. Turn on the Carter dockage tester.
4. Pour the portion into the hopper.
5. Turn off the Carter dockage tester.
6. Determine the percentage by weight of the kernels passing through the No. 8 slotted sieve.

If the percentage of kernels passing through the No. 8 slotted sieve is . . .	Then the buckwheat is . . .
20.0 or less	Large
More than 20.0	Small

Determination of dockage

Definition

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in two stages.

1. Follow *Normal cleaning procedures*, using the Carter dockage tester.
2. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after the cleaning assessment has been completed.

Dockage not reported

▲ **Important:** Dockage is not reported for

- *Buckwheat, Sample Canada (size) Account Fireburnt*
- *Buckwheat, Sample Salvage*
- *Buckwheat, Sample Condemned*

Assessing dockage in small buckwheat

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Buckwheat is considered small when more than 20.0% of the kernels pass through the No. 8 slotted sieve.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	#6
Riddle	No. 25
Top sieve	No. 6 buckwheat
Centre sieve	No. 5 buckwheat
Bottom sieve	No. 5 buckwheat
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn on the sieve cleaner control briefly to dislodge kernels.
6. Turn off the Carter dockage tester.
7. Snap the retainer rod of the aspiration pan lightly to loosen material gathered on the screen.
8. Determine dockage, using the list under *Composition of dockage.*

Composition of dockage

- Material other than whole kernels of buckwheat removed by the No. 25 riddle
- Material removed through the bottom No. 5 buckwheat sieve
- Material removed by aspiration other than whole kernels of buckwheat
- Soft earth pellets handpicked from the clean sample
- Material removed by cleaning for grade improvement

Commercially clean

Primary samples defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Any whole domestic buckwheat removed in dockage assessment is returned to the clean sample. Dockage is reduced by up to

- 0.3% for fine attritional material which passes through the No. 4.5 round-hole sieve
- 0.5% for broken or hulled buckwheat removed by aspiration or passing through the No. 5 buckwheat or the No. 6 slotted sieve

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

1. After the cleaning assessment has been completed, examine the material to be removed and select your equipment according to the material you want to remove. See the table for the list of equipment.
2. Sieve the sample by hand using the No. 6 buckwheat hand sieve.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Small buckwheat

Material to be removed	Equipment	Effect on composition of dockage
Foreign material	No. 6 buckwheat hand sieve	The material passing through the sieve is included in the dockage

Assessing dockage in large buckwheat

Normal cleaning procedure

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Buckwheat is considered large when 20.0% or less of the kernels pass through the No. 8 slotted sieve.

1. Set up the Carter dockage tester as follows:

Feed control	#7
Air control	#6
Riddle	None
Top sieve	No. 15 round-hole
Centre sieve	No. 6 slotted
Bottom sieve	Blank tray
Sieve cleaner control	On

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples shall be at least 1 kg.
    - Unofficial samples shall be at least 1 kg.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. Turn off the Carter dockage tester.
6. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material other than whole kernels of buckwheat passing over the No. 15 round-hole sieve
- Material passing through the No. 6 slotted sieve
- Material removed by aspiration other than whole kernels of buckwheat
- Soft earth pellets handpicked from the cleaned sample
- Material removed by cleaning for grade improvement

Commercially clean

Primary samples defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Any whole domestic buckwheat removed in dockage assessment is returned to the clean sample. Dockage in shipments is reduced by up to

- 0.3% for fine attritional material which passes through the No. 4.5 round-hole sieve
- 0.5% for broken or hulled buckwheat removed by aspiration or passing through the No. 5 buckwheat or the No. 6 slotted sieve

Cleaning for grade improvement

If the grade of a delivery can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

1. After the cleaning assessment has been completed, examine the material to be removed and select your equipment according to the material you want to remove. See the table for the list of equipment.
2. Sieve the sample by hand using the No. 8 slotted hand sieve.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.

3. Weigh the additional dockage and add it to the original dockage.

Cleaning for grade improvement—Large buckwheat

Material to be removed	Equipment	Effect on composition of dockage
Foreign material	No. 8 slotted hand sieve	The material passing through the sieve is included in the dockage

Assessing dockage in processed large buckwheat

Processed buckwheat is buckwheat that

- Has been cleaned at a seed cleaning plant before being delivered to terminal elevators
- Contains the type of foreign material usually found after commercial cleaning, such as attritional material

Samples may contain foreign material such as Tartary buckwheat and barley.

Normal cleaning procedure

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	#3
Riddle	None
Top sieve	No. 6 slotted
Centre sieve	No. 4.5 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. Turn off the Carter dockage tester.
6. Return all whole domestic buckwheat removed by aspiration to the cleaned sample.
7. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material removed through the No. 4.5 round-hole sieve. Deduct up to 0.3% for fine attritional material. For example, if 0.95% of material is removed, record the amount as 0.65%.
- Buckwheat hulls and other material removed by aspiration, and material remaining on top of the 4.5 round-hole sieve. Deduct up to 0.5% for broken or hulled buckwheat.
- Foreign material such as weed seeds, broken grain and roughage handpicked from the cleaned sample

Cleaning for grade improvement

Grade improvement procedures do not apply to samples of processed domestic buckwheat.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of buckwheat.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

   Example
   95.0% Buckwheat, No. 1 CAN
   4.0% Domestic Mustard Seed, No. 1 CAN Oriental
   1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of buckwheat for grading, grams

Grading factor	Sample portion size range	
	Minimum	**Maximum**
Cereal grains	50	250
Damage	10	50
Dehulled	10	50
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Immature	10	50
Matter other than cereal grains	50	250
Odour	working sample	working sample
Sclerotinia sclerotiorum	500	working sample
Size	250	250
Soft earth pellets	working sample	working sample
Stones	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Cereal grains (CGRN)

Cereal grains in buckwheat include wheat, rye, triticale, barley, oats and groats, including wild oat groats that remain in the clean sample.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Buckwheat, Sample Condemned.*

Damage (DMG)

Damage includes all dehulled seeds and seeds that are frosted, mouldy, or otherwise unsound. The hull of damaged kernels collapses under pressure, as when rolled between the thumb and forefinger.

Dehulled (DHULL)

Dehulled buckwheat is buckwheat with its hulls removed.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Buckwheat, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt samples are samples that contain kernels that show any evidence of being charred or scorched by fire.

Immature (IM)

Immature kernels

- Do not contain a groat or have a severely shriveled groat
- Have a hull which collapses under pressure

Matter other than cereal grains (MOTCG)

Matter other than cereal grains includes weed seeds and other grains that are not readily removable and may include peas, lentils, beans, corn, and other domestic or wild seeds that remain in the cleaned sample.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	Then the grade is . . .
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Buckwheat, Sample Canada (size) Account Odour*
A distinct heated odour	*Buckwheat, Sample Canada (size) Account Heated*
A distinct fireburnt odour	*Buckwheat, Sample Canada (size) Account Fireburnt*

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Size

Size is evaluated using a No. 8 slotted sieve. The size, large or small, is added to the grade name; for example, *Buckwheat, No. 1 Canada Large*.

If the percentage of kernels passing through the No. 8 slotted sieve is . . .	Then the buckwheat is . . .
20.0 or less	Large
More than 20.0	Small

Soft earth pellets (SEP)

Soft earth pellets are

- Earth pellets that crumble into fine dust under light pressure, using a finger only— if they do not crumble, they are considered *Stones*.
- Any non-toxic material of similar consistency

Procedures

1. Handpick soft earth pellets from a representative portion of the cleaned sample.
2. Soft earth pellets are removed as dockage. See *Composition of dockage*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Buckwheat, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Buckwheat, Sample Canada Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Buckwheat, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Buckwheat, Canada

Grade name	Stones %
No. 1 Canada	0.03
No. 2 Canada	0.03
No. 3 Canada	0.03

Basic grade:......................... *Buckwheat, No. 2 Canada Large*
Reason for basic grade:....... 2.0% Dehulled

If the above sample contained	Grade in western Canada
0.06% stones	*Buckwheat, Rejected No. 2 Canada Large Account Stones*
3.0% stones	*Buckwheat, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Buckwheat, Canada

Grade name	Stones %
No. 1 Canada	0.03
No. 2 Canada	0.03
No. 3 Canada	0.03

Basic grade:......................... *Buckwheat, No. 2 Canada Large*
Reason for basic grade:....... 2.0% Dehulled

If the above sample contained	Grade in eastern Canada
0.06% stones	*Buckwheat, Sample Canada Large Account Stones*
3.0% stones	*Buckwheat, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Buckwheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Any variety of buckwheat registered for production in Canada is eligible for the grade of No. 1 Canada.

Primary grade determinants tables

Buckwheat, Canada (CAN)

			Damage			Foreign material						
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Degree of soundness**	**Dehulled %**	**Immature %**	**Total %**	**Cereal grains %**	**Ergot %**	**Excreta %**	**Matter other than cereal grains %**	**Sclerotinia %**	**Stones %**	**Total %**
No. 1 Canada	58 (285)	Cool and sweet	1	1.5	4	1	Nil	0.010	0.2	Nil	0.03	1
No. 2 Canada	55 (270)	Cool and sweet	2	1.5	8	2.5	0.05	0.010	1	0.05	0.03	3
No. 3 Canada	No minimum	May have a ground or grassy odour, not musty or sour	5	5	20	5	0.25	0.010	2	0.25	0.03	5
Grade, if No. 3 specs not met			*Buckwheat, Sample Canada (size) Account Damage*			*Buckwheat, Sample Canada (size) Account Admixture*	*Buckwheat, Sample Canada (size) Account Ergot*	*Buckwheat, Sample Canada (size) Account Excreta*	*Buckwheat, Sample Canada (size) Account Admixture*	*Buckwheat, Sample Canada (size) Account Admixture*	2.5% or less—*Buckwheat, Rejected (grade) (size) Account Stones*, or *Buckwheat, Sample Canada (size) Account Stones* Over 2.5%—*Buckwheat, Sample Salvage*	*Buckwheat, Sample Canada (size) Account Admixture*

Note: The size may be added to the grade name

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean when the net dockage does not exceed 2.5% of the sample weight.

Any whole domestic buckwheat removed in dockage assessment is returned to the clean sample. Dockage in shipments is reduced by up to

- 0.3% for fine attritional material which passes through the No. 4.5 round-hole sieve
- 0.5% for broken or hulled buckwheat removed by aspiration or passing through the No. 5 buckwheat or the No. 6 slotted sieve

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as *not commercially clean*. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

Instead of the allowance for broken seed in commercially clean shipments, a direct deduction of 0.2% is applied to establish net dockage for direct shipments only.

Assessing dockage for small buckwheat

Follow the primary dockage assessment procedures, with the Carter dockage tester set as follows.

Feed control	#6
Air control	#3
Riddle	None
Top sieve	No. 5 buckwheat
Centre sieve	No. 4.5 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	Off

Dockage consists of the following:

- Material other than whole domestic buckwheat which passes through the No. 5 buckwheat or the No. 6 slotted sieve, less fine attritional material, broken or hulled buckwheat constituting not more than 0.5% of the sample by weight
- Material in excess of grade tolerances which is handpicked from the cleaned sample, other than cereal grains

Assessing dockage for large buckwheat

Follow the primary dockage assessment procedures, with the Carter dockage tester set as follows.

Feed control	#6
Air control	#3
Riddle	None
Top sieve	No. 6 slotted
Centre sieve	No. 4.5 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	Off

Dockage consists of the following

- Material other than whole domestic buckwheat that passes through the No. 6 slotted sieve, less fine attritional material, broken or hulled buckwheat constituting not more than 0.5% of the sample by weight
- Material in excess of grade tolerances which is removed by aspiration, other than whole domestic buckwheat
- Material in excess of grade tolerances which is handpicked from the cleaned sample, other than cereal grains

Grading

Buckwheat on export is graded in accordance with export grade specifications.

Export grade determinants tables

Buckwheat, Canada (CAN)

		Damage			Foreign material						
Grade name	Total removable material %	Dehulled %	Immature %	Total %	Cereal grains %	Ergot %	Excreta %	Matter other than cereal grains %	Sclerotinia %	Stones %	Total %
No. 1 Canada	2.5	1	**1.5**	4	1	Nil	0.010	0.2	Nil	0.03	1
No. 2 Canada	2.5	2	**1.5**	8	**2.5**	0.05	0.010	1	0.05	0.03	3
No. 3 Canada	2.5	5	5	20	5	**0.25**	0.010	2	**0.25**	0.03	5

14. Sunflower seed

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Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Sunflower Seed, Sample Canada Account Fireburnt*
- *Sunflower Seed, Sample Salvage*
- *Sunflower Seed, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#7 #9 for large-seeded varieties
Air control	#5 #7 for large-seeded varieties
Riddle	none
Top sieve	none
Centre sieve	blank tray
Bottom sieve	none
Sieve cleaner control	none

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
3. Sieve portions of approximately 250 grams at a time.

4. Nest the No. 24 or No. 18 round-hole sieve over one of the following sieves, depending on the size of the seeds:
    - the No. 10 round-hole sieve
    - the No. 6 buckwheat sieve
5. Handpick from the material remaining on top of the No. 24 or No. 18 round-hole sieve all whole or broken sunflower seeds. Return them to the portion passing through the No. 24 or No. 18 round-hole sieve and remaining on top of the No.10 round-hole or No. 6 buckwheat sieve.
6. Pass through the Carter dockage tester the material which has passed through the No. 24 or No. 18 round-hole sieve and remains on top of the No. 10 round-hole sieve (or the No. 6 buckwheat sieve).
7. Handpick whole sound sunflower seeds from the material removed by aspiration and return them to the cleaned sample.
8. Using a Boerner-type divider, divide a portion of approximately 250-g.

    Note: At this point the handpicked 250-g portion should be used to determine test weight.
9. Handpick the 250-g portion for inseparable material including broken hulls. Determine what components of the handpicked inseparable material will be considered dockage as directed under *Composition of dockage*
10. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material removed by either the No. 24 or No. 18 round-hole sieve, except sound whole sunflower seeds
- Material removed by aspiration, except sound whole sunflower seeds
  Note: Very immature seeds containing no meats are not considered sound.
- Material passing through either the No. 10 round-hole sieve or the No. 6 buckwheat sieve
- Coarse material handpicked from the sieved sample
- Soft earth pellets and other grains handpicked from the sieved sample up to 2.5%
- Sclerotinia present in the handpicked sample; up to 2% is treated as a grade determinant and also included in dockage.
  Note: In samples eligible for off-grades, other grains, sclerotinia and soft earth pellets are considered a grading factor and are not added to the dockage.

Commercially clean (CC)

Primary samples with dockage levels up to 5.0% are considered commercially clean.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of sunflower seed.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

    Example
    95.0% Sunflower Seed, No. 1 CAN Confectionary
    4.0% Domestic Mustard Seed, No. 1 CAN Oriental
    1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations sample as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion sizes for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of sunflower seed for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Damage	25	100
Dehulled	25	100
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Heated, rotted, mouldy	50	100
Head rot (hulls)	25	100
Head rot (seeds)	5	25
Insect damage	50	100
Odour	working sample	working sample
Other grains	100	250
Sclerotinia sclerotiorum	250	working sample
Soft earth pellets	working sample	working sample
Stones	working sample	working sample
Treated seed	working sample	working sample
Very immature seeds	25	100

Grading factors

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Sunflower Seed, Sample Condemned.*

Damage (DMG)

Damaged seeds show at least one of following characteristics:

- Head rot damage
- Heated, rotted or mouldy
- Very immature
- Insect-damaged
- Otherwise materially damaged

Dehulled (DHULL)

Hulled seeds are broken and whole seeds that are without hulls.

Earth pellets

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones.*
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets.*

Ergot (ERG)

Ergot is a plant disease producing elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Sunflower Seed, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt seeds are those that show any signs of being charred or scorched by fire.

Foreign material (FM)

Foreign material in sunflower seed includes other grains, sclerotinia and stones.

Head rot damage

Head rot is damage most frequently caused by sclerotinia head rot disease.

Damage includes

- Hulls with 50% or more of the surface covered by white patches
- Seeds that are off colour, e.g., tan to dark brown
- Seeds that may contain small black sclerotia

Procedures

1. Using a Boerner-type divider, divide a representative portion for hulls.
2. Examine the portion and remove hulls with white patches covering 50% or more of the hull.
3. Divide the remaining representative portion for a subsample not less than 5 g.
4. Remove the hulls and examine the seeds for off-colour and the presence of sclerotia.

Heated, rotted or mouldy (HTD)

Heated seeds have the colour and or odour typical of seeds that have heated in storage or have been damaged by artificial drying.

Procedures

1. Pass the representative portion of the clean sample through a barley pearler for 3 to 5 seconds.
2. Separate heated, rotted or musty kernels from sound kernels.
3. Heated seeds of other grains are included in the tolerance for *Heated*

If you are unsure whether the kernel is heated, rotted or musty, cut the seed lengthwise and examine the exposed meat. Brown-coloured meat is considered to be heated.

Insect damage (I DMG)

Insect-damaged seeds have hull perforations of any size caused by insects and include any hulled seeds which have been bored or chewed by insects.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Sunflower, Sample Canada Account Odour*
An excessive heated odour	*Sunflower, Sample Canada Account Heated*
An excessive fireburnt odour	*Sunflower, Sample Canada Account Fireburnt*

Other grains (OGS)

Other grains are any other grains that are not removed during cleaning. Other grains are considered a grading factor and are added to the dockage.

In samples eligible for off-grades, other grains are considered a grading factor and are not added to the dockage.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

In samples eligible for off-grades, sclerotia are considered a grading factor and are not added to the dockage.

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure from a finger—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Procedures

Earth pellets may be removed as dockage. See *Normal cleaning procedures.*

In samples eligible for off-grades, soft earth pellets are considered a grading factor and are not added to the dockage.

1. Return the pellets to the sample.
2. Handpick soft earth pellets from a representative portion of 100 g of the cleaned sample.
3. If soft earth pellets is the grade determinant, grade the sample *Sunflower Seed, Sample Canada Account Admixture.*

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Sunflower Seed, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Sunflower Seed, Sample Canada Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Sunflower Seed, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Sunflower Seed, Canada, Oil

Grade name	Stones %
No. 1 Canada	0.1
No. 2 Canada	0.1

Basic grade:......................... *Sunflower Seed, No. 1 Canada, Oil*

If the above sample contained	Grade in western Canada
0.2% stones	*Sunflower Seed, Rejected No. 1 Canada Oil Account Stones*
3.0% stones	*Sunflower Seed, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Sunflower Seed, Canada, Oil

Grade name	Stones %
No. 1 Canada	0.1
No. 2 Canada	0.1

Basic grade:......................... *Sunflower Seed, No. 1 Canada, Oil*

If the above sample contained	Grade in eastern Canada
0.2% stones	
3.0% stones	*Sunflower Seed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Sunflower Seed, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Sunflower seed is graded according to end use, either confectionary or oil.

On written request, the name of the variety as described by the owner or shipper may be shown as a notation in the remarks section of a certificate; for example, Said to be Commander variety.

Very immature seeds (VIM SDS)

Very immature seeds are whole sunflower seeds that contain no meat.

Procedures

1. Using a Boerner-type divider, divide a representative portion.
2. Separate whole shrunken seed kernels from sound kernels.
3. Determine the percentage of seeds that do not contain meat by either pressing the seed on a hard surface with finger pressure or by manually opening the seed.
4. Very immature seeds are included in the percentage of damaged seeds for grade determination.

Primary and export grade determinants tables

Sunflower Seed, Canada Confectionery (CAN)

Grade name	Standard of quality		Damage				**Dehulled seeds %**	Foreign material included in dockage				
	Minimum test weight (kg/hL)	**Degree of soundness**	**Head rot %**	**Heated %**	**Insect damage %**	**Total %**		**Excreta %**	**Other grains %**	**Sclerotinia %**	**Soft earth pellets %**	**Stones %**
No. 1 Canada	31 (155)	Well matured and sweet	2	0.5	2	4	5	0.005	2.5	1	2.5	0.1
No. 2 Canada	29 (144.4)	Reasonably well matured and sweet	5	1	4	8	5	0.005	2.5	2	2.5	0.1
Grade, if No. 2 specs not met	*Sunflower Seed, Sample Canada Account Light Weight*		*Sunflower Seed, Sample Canada Account Damage*	*Sunflower Seed, Sample Canada Account Heated*	*Sunflower Seed, Sample Canada Account Insect Damage*	*Sunflower Seed, Sample Canada Account Damaged*	*Sunflower Seed, Sample Canada Account Dehulled*	*Sunflower Seed, Sample Canada Account Excreta*	*Sunflower Seed, Sample Canada Account Admixture*	*Sunflower Seed, Sample Canada Account Admixture*	*Sunflower Seed, Sample Canada Account Admixture*	2.5% or less—*Sunflower Seed, Rejected (grade) Account Stones*, or *Sunflower Seed, Sample Canada Account Stones* Over 2.5%—*Sunflower Seed, Sample Salvage*

Sunflower Seed, Canada Oil (CAN)

	Standard of quality		Damage					Foreign material included in dockage					
Grade name	**Minimum test weight (kg/hl)**	**Degree of soundness**	**Head rot %**	**Heated %**	**Insect damage %**	**Total %**	**Dehulled seeds %**	**Excreta %**	**Other grains %**	**Sclerotinia %**	**Soft earth pellets %**	**Stones %**
No. 1 Canada	35.0 (169)	Well matured and sweet	2	0.5	2	5	5	0.02	2.5	1	2.5	0.1
No. 2 Canada	31.0 (148.4)	Reasonably well matured and sweet	5	1	4	10	5	0.02	2.5	2	2.5	0.1
Grade, if No. 2 specs not met	*Sunflower Seed, Sample Canada Account Light Weight*		*Sunflower Seed, Sample Canada Account Damage*	*Sunflower Seed, Sample Canada Account Heated*	*Sunflower Seed, Sample Canada Account Insect Damage*	*Sunflower Seed, Sample Canada Account Damaged*	*Sunflower Seed, Sample Canada Account Dehulled*	*Sunflower Seed, Sample Canada Account Excreta*	*Sunflower Seed, Sample Canada Account Admixture*	*Sunflower Seed, Sample Canada Account Admixture*	*Sunflower Seed, Sample Canada Account Admixture*	2.5% or less—*Sunflower Seed, Rejected (grade) Account Stones*, or *Sunflower Seed, Sample Canada Account Stones* Over 2.5%—*Sunflower Seed, Sample Salvage*

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean (CC)

Shipments with dockage levels up to 5.0% are considered commercially clean. Dockage is reported to the nearest

- 0.1% for samples representing commercially clean shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

A direct deduction of up to 0.2% is applied to take into account the buildup of attritional material for direct shipments only. Dockage is assessed using procedures for primary samples.

Grading

Sunflower seed on export is graded in accordance with primary grade standards and specifications

15. Safflower seed

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Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for

- *Safflower Seed, Sample Canada Account Fireburnt*
- *Safflower Seed Sample Salvage*
- *Safflower Seed, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#7
Air control	#7
Riddle	none
Top sieve	blank
Centre sieve	none
Bottom sieve	none
Sieve cleaner control	

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
3. Sieve portions of approximately 250 grams at a time.
4. Sift the sample over a No. 15 round-hole sieve nested over a No. 6 slotted sieve or a No. 6 buckwheat sieve or both, with a blank sieve on the bottom.
5. Turn on the Carter dockage tester.
6. Pour into the hopper the part of the sample that has passed through the No. 15 round-hole sieve.

7. From the material remaining on the top of the No. 15 round-hole sieve, handpick all whole or broken safflower seeds and return them to the cleaned sample.
8. Determine dockage, using the list that follows, under *Composition of dockage*.

Composition of dockage

- Material removed by the No. 15 round-hole sieve, except sound whole safflower seeds
- Material removed by the No. 6 slotted, the No. 6 buckwheat sieve, or both
- Material removed by aspiration; except sound whole safflower seeds
- Soft earth pellets handpicked from the clean sample constituting up to 2.5% of the sample by weight—if the percentage of soft earth pellets is 2.5% or more, soft earth pellets becomes a grading factor.

Commercially clean

Primary samples defined as commercially clean may contain up to 2.5% by weight of dockage.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of safflower seed.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

Example
95.0% Safflower Seed, No. 1 CAN
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of safflower seed for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Damage	25	100
Dehulled	25	100
Empty hulls	100	250
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Heated	100	250
Matter other than cereal grains	100	250
Odour	working sample	working sample
Other grains	100	250
Rotted	50	100
Soft earth pellets	working sample	working sample
Stones	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Safflower Seed, Sample Condemned.*

Damage (DMGE)

Damaged seeds are frosted, green, broken, heated, insect-damaged or otherwise unsound.

Dehulled (DHULL)

Intact safflower seeds are called "achenes" which consists of the hull containing the seed. Dehulled seeds are broken or whole seeds without hulls.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets.*

Empty hulls (HULLS)

Intact safflower seeds are called "achenes" which consists of the hull containing the seed. Empty hulls are achenes with intact hulls but which contain no seeds. This also includes hulls having less than one-third of the seed attached.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Safflower Seed, Held IP Suspect Contaminated Grain.*

Foreign material (FM)

Foreign material is anything other than safflower that remains in the sample after the removal of dockage. Some types of foreign material have separate tolerances.

Heated (HTD)

Heated seeds have the colour or odour typical of grain that has heated or deteriorated in storage. Heated kernels include kernels discoloured from artificial drying, but not charred kernels. Heated seeds of other grains are included in the tolerance for *Heated*

Matter other than cereal grains (MOTCG)

Matter other than cereal grains refers to weed seeds and other grains that are not readily removable and may include

- Peas, lentils, beans, corn, other domestic or wild seeds
- Ergot and sclerotinia sclerotiorum

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Safflower Seed, Sample Canada, Account Odour*
An excessive heated odour	*Safflower Seed, Sample Canada, Account Heated*
An excessive fireburnt odour	*Safflower Seed, Sample Canada, Account Fireburnt*

Other grains (OGRN)

Other grains in safflower seed include wheat,rye, triticale, barley, oats and groats, including wild oat groats, that remain in the cleaned sample.

Rotted (ROT)

Seeds have the colour or odour typical of grain that has heated or deteriorated in storage. Rotted seed is considered in combination with heat-damaged kernels.

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Soft earth pellets in safflower seed are considered as *Foreign material.*

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Safflower Seed, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Safflower Seed, Sample Canada Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Safflower Seed, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Safflower Seed, Canada

Grade name	Stone %
No. 1 Canada	0.1
No. 2 Canada	0.1
No. 3 Canada	0.1

Basic grade:......................... *Safflower Seed, No. 2 Canada*
Reason for basic grade:....... 4.0% Dehulled

If the above sample contained	Grade in western Canada
0.2% stones	*Safflower Seed, Rejected No. 2 Canada Account Stones*
3.0% stones	*Safflower Seed, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Safflower Seed, Canada

Grade name	Stones %
No. 1 Canada	0.1
No. 2 Canada	0.1
No. 3 Canada	0.1

Basic grade:......................... *Safflower Seed, No. 2 Canada*
Reason for basic grade:....... 4.0% Dehulled

If the above sample contained	Grade in eastern Canada
0.2% stones	*Safflower Seed, Sample Canada Account Stones*
3.0% stones	*Safflower Seed, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Safflower Seed, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Safflower seed is graded without reference to variety.

Primary and export grade determinants tables

Safflower Seed, Canada (CAN)

	Standard of quality	Damage		Foreign material				Hulls	
Grade name	**Degree of soundness**	**Heated %**	**Total %**	**Excreta %**	**Matter other than cereal grains %**	**Stones %**	**Total %**	**Empty hulls %**	**Dehulled seeds %**
No. 1 Canada	Well matured, good natural colour	Nil	3	0.02	0.2	0.1	0.5	0.5	2
No. 2 Canada	Reasonably well matured, may be moderately weather-stained	Nil	10	0.02	0.5	0.1	2	1	5
No. 3 Canada	Excluded from higher grades on account of weather-stained, may have the odour associated with low-quality seed but not distinctly sour, musty or rancid	1	10	0.02	1	0.1	5	2	8
Grade, if No. 3 specs not met		*Safflower Seed, Sample Canada Account Heated*	*Safflower Seed, Sample Canada Account Damaged*	*Safflower Seed, Sample Canada Account Excreta*	*Safflower Seed, Sample Canada Account Admixture*	2.5% or less—*Safflower Seed, Rejected (grade) Account Stones* or *Safflower Seed, Sample Canada, Account Stones* Over 2.5%—*Safflower Seed, Sample Salvage*	*Safflower Seed, Sample Canada Account Admixture*	*Safflower Seed, Sample Canada Account Hulls*	*Safflower Seed, Sample Canada Account Dehulled*

Export shipments

Export shipments can be commercially clean or not commercially clean.

Commercially clean

Shipments defined as commercially clean may contain up to 2.5% by weight of dockage.

Dockage is reported to the nearest
- 0.1% for samples representing commercially clean shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest
- 0.1% for samples representing shipments loaded form a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

less a deduction of up to 0.2% for direct shipments only.

Grading

Safflower seed on export is graded in accordance with primary grade standards and specifications.

16. Peas

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Classes, types and varieties

Classes

Peas are designated into two classes, Green Peas and Peas other than green. The method of determining the class of a pea is by cotyledon colour and, in the case of Maple, Austrian, Vienna and Dun peas, seed coat and cotyledon colour.

Marrowfat peas are considered as Peas, other than green.

The OGGG web version displays photos of the different types of peas.

Samples of peas are graded according to the food pea grade determinant tables unless designated by the shipper as feed peas, and then the feed pea grade determinant table is used.

Determination of commercial cleanliness

Dockage is not assessed on pea samples that meet the commercially clean specifications set out in the procedures below. All samples must be analyzed to determine if they meet commercially clean specifications prior to dockage being assessed. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.2% of small seeds and coarse vegetable matter then dockage will be assessed using the procedures defined under *Determination of Dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures, and applying the specifications, listed below.

Foreign material in commercially clean peas is treated as a grading factor and not assessed as dockage.

Samples are considered to be commercially clean when:

- Containing 0.2% or less of any small seeds and coarse vegetable matter and,
- Pea hulls constitute 10% or less by weight of the split peas in the sample.

To determine if the sample is processed, the following steps are to be completed:

1. Using a Boerner-type divider, divide the sample to obtain a representative portion of at least 1 kg.
2. Select the slotted sieve (#8, #9 or #11) that will achieve maximum removal of splits with a minimum loss of whole peas. Nest the selected slotted sieve over a No. 4.5 round hole sieve. Sieve the sample, approximately 250 grams at a time, over the nested sieves.
3. Broken pea fragments that pass through the 4.5 round hole sieve are to be separated from the small seeds and included in the total percentage of split peas.
4. Small seeds passing through the No. 4.5 round hole are weighed and the percentage calculated.
5. The portion remaining on top of the slotted sieve and 4.5 round-hole sieve is handpicked to remove coarse vegetable matter and its percentage calculated.
6. The percentages of small seeds and coarse vegetable matter are added together to determine if the total meets the commercially clean specification.
7. Splits and pea hulls are separated from the entire sample. Determine if the pea hulls constitute 10% or less by weight of the split peas.

If any of the components exceed the allowable limits as defined above, the sample will become *not commercially clean* and dockage is assessed using procedures for primary samples. Dockage is reported to the nearest 0.1%.

Commercial cleanliness is not assessed in Feed peas.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Peas, Sample Canada* (colour or variety) *Account Fireburnt*
- *Peas Sample Salvage*
- *Peas, Sample Condemned*
- *Feed Peas, Canada*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples shall be at least 1 kg.
    - Unofficial samples shall be at least 1 kg.
2. Sieve portions of approximately 250 grams at a time.
3. Sieve the sample over the slotted sieve that will achieve maximum removal of splits with minimum loss of whole peas. Use one of the following sieves:

   No. 8 slotted No. 9 slotted No. 11 slotted
4. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- All coarse vegetable matter such as pods, stems, straw, and thistle tops handpicked from the sieved sample
- Split peas removed through sieving—Split peas removed by sieves are handpicked from the dockage material and calculated as a percentage based on the gross weight of the sample. This portion is recorded as the percentage of splits in dockage
- Other material removed through sieving including pea hulls

Determination of foreign material in feed peas

Foreign material in feed peas is defined as any material other than whole peas, broken peas or pea seed coats.

Representative portion for analysis

Minimum—100g	Optimum—250 g	Export—250 g

Procedures

1. Using a Boerner-type divider, divide the gross sample to obtain a representative portion.
2. Handpick the representative portion to remove all foreign material.

   Note: Any approved sieve may be used to expedite the determination of foreign material, however only material other than peas, broken peas and pea seed coats is assessed as foreign material.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of peas.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Peas No. 1 CAN Yellow
4.0% Peas Sample CAN Yellow Account Splits
1.0% dockage

Sizing of yellow peas

In yellow peas only, if size is determined as small or large, then size becomes part of the grade name. If a sample does not meet the definition for large or small, it is graded without reference to size.

1. Using a Boerner-type divider, divide a representative portion of 250 g.
2. Sieve the representative portion over the No. 14 round-hole sieve.
3. Determine the portion remaining on top of No. 14 round-hole sieve.

<table>
<tr><th>95% or more remains on top of No. 14 round-hole sieve</th><th colspan="3">Less than 95% remains on top of No. 14 round-hole sieve</th></tr>
<tr><td rowspan="7">The sample is designated <i>Large</i>.
Example:
<i>Peas, No.2 Canada Yellow Large</i></td><td colspan="3">1. Recombine the sample.</td></tr>
<tr><td colspan="3">2. Sieve the sample over the No. 15 round-hole and No. 11 round-hole sieves.</td></tr>
<tr><td colspan="3">3. Determine the portion passing through the No. 15 round-hole sieve.</td></tr>
<tr><td colspan="2">90% or more passes through the No. 15 round-hole sieve</td><td>Less than 90% passes through</td></tr>
<tr><td colspan="2">Determine the amount that remains on top of the No. 11 round-hole sieve.</td><td rowspan="3">Graded without reference to size
Example:
<i>Peas, No.2 Canada Yellow</i></td></tr>
<tr><td>95% or more</td><td>Less than 95%</td></tr>
<tr><td>The sample is designated <i>Small</i>
Example:
<i>Peas, No.2 Canada Yellow Small</i></td><td>Graded without reference to size
Example:
<i>Peas, No. 2 Canada Yellow</i></td></tr>
</table>

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is called the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading of peas for human consumption refer to percentages of the cleaned sample, or the net weight.

Gross weight of sample

The sample as it arrives is referred to as the uncleaned sample. Its weight is the gross weight of the sample.

Note: Percentages by weight for grading feed peas refer to percentages of the uncleaned sample, or the gross weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain. An *order* is issued annually to allow non-registered varieties of Peas to be graded higher than the lowest statutory grade.

Representative portion sizes for grading

All grading of human consumption peas is done on representative portions divided down from the cleaned sample, using a Boerner-type divider.

All grading of feed peas is done on representative portions divided down from the gross sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of peas for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Binburnt	100	500
Bleached	50	100
Colour	working sample	working sample
Cracked seed coats	50	100
Damage	50	100
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Foreign material	250	working sample
Heated	250	working sample
Inert material	working sample	working sample
Insect damage	50	100
Insect parts	working sample	working sample
Marsh spot	50	100
Odour	working sample	working sample
Other damage	50	100
Peas of other colours, classes	100	500
Pink Peas	50	100
Shrivelled	50	100
Splits	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Binburnt

Binburnt refers to peas that are blackened as a result of severe heating in storage. There is a single tolerance in feed peas for the total of heated and binburnt.

Bleached (BLCH)

Bleached applies to green peas only.

Green peas are considered bleached if one-eighth or more of the surface of the cotyledon is bleached to a distinct yellow colour which is in marked contrast to its natural colour.

Procedures

1. Examine a representative portion of the cleaned sample for any distinctly bleached or suspect bleached green peas.
2. Remove the seed coat from suspect seeds to determine the size of the bleached area on the cotyledons.

Classes

There are two classes of peas, green and other than green. The class forms part of the grade name. See *Peas of other colours.*

Colour (CLR)

Colour as a grade determinant is assessed after the removal of damaged peas and peas of other colours.

If peas are	**Colour is . . .**
A bright, normal colour, lightly earth tagged or lightly stained	Good
Moderately immature, moderately earth tagged or stained	Fair

If a sample of yellow peas contains . . .	**The sample is . . .**
Green peas	Considered damaged only if peas are damaged from another cause
Whole or split peas which are distinctly green throughout as a result of immaturity or variety	*Peas of other colours*
Immature yellow peas	Considered damaged only if peas are damaged from another cause
Immature, but not distinctly green, peas	Not considered damaged, but taken into account in the general evaluation of the sample

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "*Canada Grain Act*" as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Peas, Sample Condemned*.

Cracked seed coats (CSDC)

Cracked seed coats includes

- Peas with cracked seed coats—if the peas are otherwise damaged, they are included in the tolerance for damage, not cracked seed coats
- Peas with all or part of the seed coat removed
- Broken peas with less than one-fourth of the pea broken off—broken peas with more than one-fourth of the pea broken off are considered damaged

Damage (DMG)

Damaged peas include

- Split or broken peas where more than one-fourth of the pea is broken off
- Whole peas that are sprouted, heated, shrivelled, damaged by insects, badly deteriorated or discoloured by weather or by disease, or that are otherwise damaged in a way that seriously affects their appearance or quality

Earth pellets

See *Foreign material*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies that have a purplish-black exterior, a purplish-white to off-white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Peas, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt kernels have been charred or scorched by fire. No fireburnt kernels are allowed in peas, split peas or feed peas.

Foreign material (FM)

Foreign material is not a grading factor in feed peas. Foreign material is any material other than peas, broken peas or pea seed coats.

Heated (HTD)

Peas or split peas that have dull seed coats and discoloured cotyledons ranging from light tan to dark brown are considered heated.

Procedures

1. Pick out heated peas by hand
2. Cut the kernels to expose the cotyledon
3. Heated seeds of other grains are included in the tolerance for *Heated*

If peas are . . .	Grading is . . .
Lightly damaged, with tan-coloured meats and distinct heated odour	Heated
Otherwise	Damaged

Inert material

Inert material refers to mineral matter such as stones, coal shale and hard and soft earth pellets.

Insect damage (I DMG)

Insect damage in peas or split peas refers to damage caused by insects such as weevils.

Insect parts (I PARTS)

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

Marsh spot

This nutritional disorder, caused by manganese deficiency in the soil, results in dark reddish brown spots or cavities on the inner surface of the cotyledons. Marsh spot is considered *Other damage* in peas.

Procedure

Pearl the representative portion to split and expose the inner surface of the cotyledon.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is....	Then the grade is....
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Peas, Sample Canada (colour and size) Account Odour*
An excessive heated odour	*Peas, Sample Canada (colour and size) Account Heated*
An excessive fireburnt odour	*Peas, Sample Canada (colour and size) Account Fireburnt*

Other damage (ODMG)

Other damage is

- Any damage other than splits, insect damage, heated or shrivelled
- Any discolouration or physical damage on the face of the cotyledon

Pink peas

Pink peas refers to staining caused by the bacteria *Erwinia Rhapontici*

Food peas

- Surface discolouration is to be considered in the overall colour assessment of the sample
- Discolouration that extends into the cotyledon is to be considered damaged

Feed peas

- Colour is not a factor

Care must be taken in assessing these pink peas as there are pink seed treatments for peas being used. Questionable samples are to be handled as per the ISO national procedure for handling suspect contaminated seeds.

Peas of other colours (POOCLR)

Colour is determined by the cotyledon colour and, in the case of Maple, Austrian and Dun peas, seed coat and cotyledon colour. *Peas of other colours* includes any whole and split peas that are obviously of another colour or class.

Pulses other than green, yellow or orange peas

In feed peas, pulses other than green, yellow or orange peas refers specifically to maple and marrowfat peas. These are not considered as part of foreign material. Other pulses such as beans, chick peas and lentils are included in foreign material.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior. See *Foreign material.*

Shrivelled (SHV)

Shrivelled peas are distinctly distorted and shrunken, or have a severely dimpled surface.

Splits (SPLTS)

Splits include split peas, pea hulls, split peas of other colours, broken pieces that are less than three-quarters of the whole seed, and cotyledons that are loosely held together by the seed coat.

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Peas, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety

On written request, the variety is shown as part of the grade name, for example, *Peas, No. 2 Canada, Trapper*. "Varietal purity not guaranteed" is shown in the Remarks section of certificate issued using a varietal name.

Primary and export grade determinants tables

Peas, Canada Green (CAN)

Grade name	Standard of quality	Other classes and bleached			Foreign material			
	Colour	Other classes %	Bleached %	Total %	Ergot %	Excreta %	Insect parts %	Total %
No. 1 Canada	Good natural colour	0.5	2.0	2.0	0.05	0.01	0.02	0.1
No. 2 Canada	Fair colour	1.0	3	3.8	0.05	0.01	0.02	0.2
No. 3 Canada	Off-colour	2	5	6.5	0.05	0.01	0.02	0.5
Grade, if No. 3 specs not met		10.0% or less— *Peas, Sample Canada (Green or variety) Account Mixed Colours* Over 10.0%— *Peas, Sample Canada Account Mixed Colours*	*Peas, Sample Canada (Green or variety) Account Bleached*	*Peas, Sample Canada (Green or variety) Account Mixed Colours and Bleached*	*Peas, Sample Canada (Green or variety) Account Ergot*	*Peas, Sample Canada (Green or variety), Account Excreta*	*Peas, Sample Canada (Green or variety) Account Admixture*	*Peas, Sample Canada (Green or variety) Account Admixture*

Grade name	Cracked seed coats including splits %	Damage					
		Heated %	Insect damage %	Other damage %	Shriveled %	Splits %	Total %
No. 1 Canada	5	Nil	0.3	2	2	0.5	3
No. 2 Canada	8	0.1	0.8	4	4	1	5
No. 3 Canada	13	0.5	2.5	10	8	5	12
Grade, if No. 3 specs not met	*Peas, Sample Canada (Green or variety) Account Cracked Seed Coats*	*Peas, Sample Canada (Green or variety) Account Heated*	*Peas, Sample Canada (Green or variety) Account Insect Damage*	*Peas, Sample Canada (Green or variety) Account Damage*	*Peas, Sample Canada (Green or variety) Account Shriveled*	*Peas, Sample Canada (Green or variety) Account Splits*	*Peas, Sample Canada (Green or variety) Account Damage*

Note: The colour, green or yellow, is added to the grade name. Alternatively, upon written request, the variety name will be added to the grade name and the statement "Varietal purity not guaranteed" shown in the remarks section of any certificate issued.

Peas, Canada, other than Green (CAN)

Grade name	Standard of quality	Other colours %	Foreign material			
	Colour		Ergot %	Excreta %	Insect parts %	Total %
No. 1 Canada	Good natural colour	1.0	0.05	0.01	0.02	0.2
No. 2 Canada	Fair colour	2.0	0.05	0.01	0.02	0.5
Extra No. 3 Canada	Fair colour	2.0	0.05	0.01	0.02	0.5
No. 3 Canada	Off-colour	3	0.05	0.01	0.02	1
Grade, if No. 3 specs not met		*Peas, Sample Canada (Yellow or variety) Account Mixed Colours*	*Peas, Sample Canada (Yellow or variety) Account Ergot*	*Peas, Sample Canada (Yellow or variety), Account Excreta*	*Peas, Sample Canada (Yellow or variety), Account Admixture*	*Peas, Sample Canada (Yellow or variety) Account Admixture*

Grade name	Cracked seed coats including splits %	Damage					
		Heated %	Insect damage %	Other damage %	Shriveled %	Splits %	Total %
No. 1 Canada	5	Nil	1.0	3	3	1	3
No. 2 Canada	9.5	0.05	1.5	5	5	2.5	5
Extra No. 3 Canada	13	0.05	1.5	5	5	5	8.5
No. 3 Canada	15	0.2	4	10	7	5	10
Grade, if No. 3 specs not met	*Peas, Sample Canada (Yellow or variety) Account Cracked Seed Coats*	*Peas, Sample Canada (Yellow or variety) Account Heated*	*Peas, Sample Canada (Yellow or variety) Account Insect Damage*	*Peas, Sample Canada (Yellow or variety) Account Damage*	*Peas, Sample Canada (Yellow or variety) Account Shriveled*	*Peas, Sample Canada (Yellow or variety) Account Splits* Over 5% and over 3% other colours—*Peas, Sample Canada, Account Mixed Colours and Splits*	*Peas, Sample Canada (Yellow or variety) Account Damage*

Note: The colour, green or yellow, is added to the grade name. Alternatively, upon written request, the variety name will be added to the grade name and the statement "Varietal purity not guaranteed" shown in the remarks section of any certificate issued.

Peas, Canada Feed (CAN)

Grade name	Fireburnt %	Heated and binburnt %	Pulses other than green, yellow or orange peas %	Inert material %	Ergot %	Excreta %
Canada Feed Peas	Nil	1	5	1	0.05	0.02
Grade, if Feed peas specs not met	*Peas, Sample Canada Feed Account Fireburnt Kernels*	*Peas, Sample Canada Feed Account Heated*	*Peas, Sample Canada Feed Account Pulses Other than Green, Yellow or Orange Peas*	*Peas, Sample Canada Feed Account Inert Material*	*Peas, Sample Canada Feed Account Ergot*	*Peas, Sample Canada Feed Account Excreta*

Export shipments

Peas, on export, are graded in accordance with primary grade standards and specifications. Foreign material in commercially cleaned peas is treated as a grading factor and not assessed as dockage. Cargoes containing dockage may not be shipped except with permission from the CGC.

Commercially clean

Samples are considered to be commercially clean when:

- Containing 0.2% or less of any small seeds and coarse vegetable matter and,
- Pea hulls constitute 10% or less by weight of the split peas in the sample.

To determine if the sample is processed, the following steps are to be completed:

1. Using a Boerner-type divider, divide the sample to obtain a representative portion of at least 1000 grams
2. Select the slotted sieve (#8, #9 or #11) that will achieve maximum removal of splits with a minimum loss of whole peas. Nest the selected slotted sieve over a No. 4.5 round hole sieve. Sieve the sample, approximately 250 grams at a time, over the nested sieves.
3. Broken pea fragments that pass through the 4.5 round hole sieve are to be separated from the small seeds and included in the total percentage of split peas.
4. Small seeds passing through the No. 4.5 round hole are weighed and the percentage calculated
5. The portion remaining on top of the slotted sieve is handpicked to remove coarse vegetable matter and its percentage calculated
6. The percentages of small seeds and coarse vegetable matter are added together to determine if the total meets the commercially clean specification
7. Splits and pea hulls are separated from the entire sample. Determine if the pea hulls constitute 10% or less by weight of the split peas

If any of the components exceed the allowable limits as defined above, the shipment becomes *not commercially clean* and dockage is assessed using procedures for primary samples. Dockage is reported to the nearest

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material for direct shipments only.

Commercial cleanliness is not assessed in Feed peas.

17. Corn

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Determination of dockage

Definitions

In Eastern Canada the terms of delivery or terms of a contract will determine if dockage is to be assessed. In Western Canada dockage may only be assessed on tough, damp, moist or wet corn. The CGC will only assess dockage upon request. Dockage is assessed to the nearest 0.1%. Once dockage material has been removed it will not be reintroduced to the sample to determine the grade.

Cracked Corn and Foreign Material (CCFM) is a grading factor and will be assessed when determining the grade.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the manual.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported when corn is graded

- *Corn, Sample CE Account Fireburnt*
- *Corn, Sample Salvage*
- *Corn, Sample Condemned*

Normal cleaning procedures:

▲ **Important:** Wear gloves and a mask to handle any sample which you suspect may contain hazardous substances.

Assess dockage before assessing test weight.

Procedures for normal cleaning of corn require

- No. 12 round-hole hand sieve for corn with 25% moisture or less
- No. 14 round-hole hand sieve for corn over 25% moisture

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples shall be at least 1kg.
    - Unofficial samples shall be at least 1 kg.
2. Sieve approximately 250 g at a time on the appropriate hand sieve until all possible material has fallen through the sieve.
3. Handpick material remaining on top of the sieve as described under *Composition of dockage*.

Composition of dockage

- All material which passes through the No. 12 or No. 14 round-hole sieve
- All foreign material and pieces of cob handpicked from the sample, excluding stones

Estimating test weight of well-matured corn after drying

Note: Test weight is determined on corn prior to removal of cracked corn and foreign material. When the Terms of Delivery or terms of a contract state that dockage can be deducted then test weight is determined after the removal of dockage.

Corn samples that contain a high percentage of moisture typically show an increase in test weight after drying. Use the following table to predict the test weight of well-matured corn before drying.

▲ **Important:** This is only a guide, and works only with well matured corn. Samples should be checked yearly to ensure that the formula applies for that crop condition.

Moisture range	Amount to add	
	kg/hl	g/0.5 L
15.8 - 16.4	0.5	2.6
16.5 - 16.9	1.0	5.2
17.0 - 17.3	2.0	10.5
17.4 - 17.6	2.1	11.0
17.7 - 17.9	2.2	11.5
18.0 - 18.3	2.3	12.0
18.4 - 18.6	2.4	12.5
18.7 - 18.9	2.5	13.0

1. Find the moisture range for the test weight of the sample.
2. Add the amount for that moisture range in the appropriate units, either kg/hl or g/l.

▲ **Important**: Corn samples are not to be downgraded on the basis of an "estimated" test weight. Questionable samples must be dried by exposure and then have the test weight determined.

For example,
The moisture for the tested sample is 17.5%, and the test weight is in kg/hl.

Moisture range	Amount to add	
	kg/hl	g/0.5 L
17.4 - 17.6	2.1	11.0

Add 2.1 to the test weight in kg/hl.

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain. An order is issued annually to allow non-registered varieties of Corn to be graded higher than the lowest statutory grade.

Representative portions for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of corn for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Caramelized kernels	100	250
Classes	100	working sample
Cracked corn and foreign material	working sample	working sample
Damage	100	250
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Heated and rotted	100	500
Odour	working sample	working sample
Stones	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Blue-eye mould

Germs of kernels appear dark blue with mould, or there may be just a visible mouldy blue streak under the hull of the germ. In the second case, peel back the hull from the germ to examine the germ.

Blue-eye mould is included in the tolerance for *Damage*.

Caramelized kernels

Caramelized kernels are kernels that were very immature when dried at a high temperature in a dryer, and the heat has turned the kernel to a scorched colour similar to that of heated kernels. The outer hull of the kernel may be peeled off showing a slightly damaged kernel inside. These kernels are classed as *Damaged*.

Classes

Corn is classed as yellow, white, or mixed. The class forms part of the grade name; for example, *Corn, Sample CW Yellow Account Heated*.

Samples of yellow and white corn containing less than 95.0% of one class are designated *Mixed*; for example, *Corn No. 1 CE Mixed*.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Corn, Sample Condemned*.

Cracked corn and foreign material (CCFM)

Cracked corn and foreign material includes any of the following:

- All material including kernels and pieces of kernels of corn or any other grains which pass through a No. 12 round-hole sieve or, for samples with a moisture level over 25.0%, through the No. 14 round-hole sieve
- All foreign material other than stones handpicked from the sample, including pieces of cobs that were not removed by sieving

Procedures

▲ **Important:** Follow procedures for assessing dockage.

Note: Because breakage occurs during handling at terminal elevators, round down percentages by weight of CCFM to the nearest whole number on all officially sampled and inspected domestic or export shipments from a terminal elevator.

For example, a sample containing 4.7% CCFM by weight is recorded as containing 4.0% CCFM for grading purposes only on officially sampled and inspected shipments from a terminal elevator.

Damage (DMG)

Damaged kernels include whole kernels or pieces of kernels which are

- Affected by blue-eye mould and other types of moulds
- Sprouted
- Ground-damaged
- Weathered
- Diseased
- Frosted
- Scorched, from a drier
- Heated, naturally, or from a drier, or caramelized
- Rotted

Earth pellets

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Cracked corn and foreign material*.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Corn, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt kernels are kernels charred or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal with numerous air holes. The air holes result in a low weight kernel which crumbles easily under pressure.

Procedures

Samples of corn containing fireburnt kernels are graded *Corn, Sample CW/CE (class) Account /Fireburnt.*

Foreign material (FM)

See *Cracked corn and foreign material (CCFM).*

Heated (HTD)

Heated kernels have at least one of the following characteristics:

- Whole kernels or pieces of kernels which range in colour from amber to dark brown over the entire kernel
- Kernels which are totally discoloured by fermentation and show no natural colour on the crowns or dorsals, or both
- The germ of the kernel is amber to dark brown and is severely puffed in the germ area when heated in a drier
- Heated seeds of other grains are included in the tolerance for *Heated*

If kernels exhibit none of the above characteristics, but are not whole or sound, they are classed as *Damaged.*

Note: Cracked corn and foreign material that is heated is included with heated corn for grade assessment.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Grains grading No. 1 through 4 must be cool and sweet. Corn grading No. 5 may have a slight odour associated with the low quality, but the odour cannot be sour or musty.

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Corn, Sample CW/CE Account Odour*
An excessive heated odour	*Corn, Sample CW/CE Account Heated*
An excessive fireburnt odour	*Corn, Sample CW/CE Account Fireburnt*

Rotted (ROT)

Rotted kernels are whole kernels or pieces of kernels which are visibly in advanced stages of decomposition and feel spongy under pressure. Rotted kernels are included in the percentage of heated kernels for grade assessment.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Corn, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Corn, Sample CE (class) Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Corn, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Corn, Canada Western, White, Yellow or Mixed

Grade name	**Stones %**
No. 1 CW	0.15
No. 2 CW	0.15
No. 3 CW	0.15
No. 4 CW	0.15
No. 5 CW	0.15

Basic grade:......................... *Corn, No. 2 CW Yellow*
Reason for basic grade:....... 3.0% Cracked corn and foreign material

If the above sample contained	**Grade in Western Canada**
0.5% stones	*Corn, Rejected No. 2 CW Yellow Account Stones*
3.0% stones	*Corn, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinants table for
Corn, Canada Eastern, White, Yellow or Mixed

Grade name	**Stones %**
No. 1 CE	0.15
No. 2 CE	0.15
No. 3 CE	0.15
No. 4 CE	0.15
No. 5 CE	0.15

Basic grade:......................... *Corn, No. 2 CE Yellow*
Reason for basic grade:....... 3.0% Cracked corn and foreign material

If the above sample contained	**Grade in Eastern Canada**
0.5% stones	*Corn, Sample CE Yellow Account Stones*
3.0% stones	*Corn, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Corn, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Corn is graded without reference to variety.

Primary and export grade determinants table

Corn, Canada Western/Canada Eastern Yellow, White or Mixed (CW/CE)

	Standard of quality		Damage			Foreign material		
Grade name	**Minimum test weight kg/hL (g/0.5 L)**	**Degree of soundness**	**Heated %**	**Total %**	**Stones %**	**Excreta %**	**Total Cracked corn and foreign material %**	**Other classes %**
No. 1 CW/CE	68 (343)	Cool and sweet, uniform size	0.1	3	0.15	0.02	2	5
No. 2 CW/CE	66 (333)	Cool and sweet	0.2	5	0.15	0.02	3	5
No. 3 CW/CE	64 (322)	Cool and sweet	0.5	7	0.15	0.02	5	5
No. 4 CW/CE	62 (311)	Cool and sweet	1	10	0.15	0.02	7	5
No. 5 CW/CE	58 (291)	May have a slight odour, not sour or musty	3	15	0.15	0.02	12	5
Grade, if No. 5 specs not met	*Corn, Sample CW/CE (class) Account Light Weight*		*Corn, Sample CW/CE (class) Account Heated*	*Corn, Sample CW/CE (class) Account Damaged*	2.5% or less—*Corn, Rejected (grade) (class) Account Stones* or *Corn, Sample CE (class) Account Stones* Over 2.5%—*Corn, Sample Salvage*	Corn, Sample CW/CE (class) Account Excreta	50% or less - Corn Sample CW/CE (class) Account CCFM Over 50% - sample Cracked Corn and Foreign Material	Over 5%—Use all other grading criteria and grade as *Corn (grade) Mixed*

Note: The colour is added to the grade name.

Export shipments

Grading

Corn on export is graded in accordance with primary grade standards and specifications.

Cracked corn and foreign material (CCFM)

Because breakage occurs during handling at terminal elevators, round down percentages by weight of CCFM to the nearest whole number on all officially sampled and inspected domestic or export shipments from a terminal elevator.

For example, a sample containing 4.7% CCFM by weight is recorded as containing 4.0% CCFM for grading purposes only on officially sampled and inspected shipments from a terminal elevator.

18. Lentils

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Classes, types and varieties

Classes

Lentils are designated into two classes, Red Lentils and Lentils other than red. The method of determining the class of a lentil is by seed coat colour. Red lentils may be confirmed by the cotyledon colour.

Varieties

Lentil varieties may have a wide range of seed coat colours from green, red, speckled green, black and tan. The cotyledon color may be red, yellow or green.

Determination of dockage

Definitions

Dockage is not assessed on lentil samples that meet the commercially clean specifications set out in the Lentil Export Shipments section. All samples must be analyzed to determine if they meet commercial cleanliness standards prior to dockage being assessed. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.2% of foreign material then dockage will be assessed using the procedures defined under *Determination of Dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed.

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage is assessed in three stages.

1. Follow *Determination of cleaning procedures* using the No.14 round-hole hand sieve.
2. Follow *Normal cleaning procedures*, using the Carter dockage tester.
3. Follow procedures for *Cleaning for grade improvement*. This cleaning can be done at any time after the cleaning assessment has been completed.

Determination of cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Using a Boerner-type divider, divide from the uncleaned sample, a representative portion of approximately 250 g.
2. Sieve the representative portion over the No.14 round-hole hand sieve.

   When using hand sieves, move the sieve from left to right 20 times, using a sifting motion. One time is one complete motion from the centre to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm, or about eight inches.
3. Determine the portion remaining on top of the No.14 round-hole sieve.

   Note: When results may be affected by excessive dockage material, reduce the material through sieving or handpicking without removing whole lentils.

If ...	The sample will be cleaned as ...
10% or more remains on top of the No. 14 round-hole sieve	*Large*
Less than 10% remains on top of the No. 14 round-hole sieve	*Small*

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Lentils, Sample Canada Account Fireburnt*
- *Lentils, Sample Salvage*
- Lentils, Sample Condemned

Normal cleaning procedures

1. Set up the Carter dockage tester as follows:

   Note: Select the riddle that will achieve the maximum removal of large dockage material with the minimum removal or lodging of lentils.

Setting	Small	Large
Feed control	#5	#6
Air control	#7	#7
Riddle	No.1 or No.25	No.25 or No.6
Top sieve	No. 9 round-hole	No. 12 round-hole
Centre sieve	blank tray	blank tray
Bottom sieve	none	none
Sieve cleaner control	Off	Off

2. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. Turn off the dockage tester after sample passes through.
6. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.
7. Remove the aspiration pan.
8. Determine dockage using the list under *Composition of dockage*.

Composition of dockage

- Material other than whole lentils that remain on top of the riddle—whole sound lentils are returned to the sample
- Material which passes through the selected round-hole sieve
- Material removed by aspiration
- Material removed by special cleaning for grade improvement procedures if the grade can be improved

Commercially clean (CC)

Primary samples are considered commercially clean when they contain 0.2% or less by weight of dockage material. No dockage is reported.

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning to remove foreign material, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

1. After the cleaning assessment has been completed, sieve the sample by hand using the appropriate hand sieve.

   ▲ **Important:** When you use a hand sieve, move the sieve from left to right 30 times, using a sifting motion. One time is one complete motion from the centre, to one side, to the other side, and back to the centre. The total distance from left to right is 20 cm.

2. Weigh the additional dockage and add it to the original dockage.

Size of lentil	Equipment	Effect on composition of dockage
Small	No. 9x9 wire hand sieve No. 10 round-hole hand sieve	Material removed by the sieve is added to dockage. Not more than 5% of whole sound lentils may be removed for each single grade improvement.
Large	No. 9x9 wire hand sieve	Material removed by the sieve is added to dockage. Not more than 5% of whole sound lentils may be removed for each single grade improvement.

Determination of size (sizing)

On written request, processed lentils only, if size is determined to be large or small, then size becomes part of the grade name. If a sample does not meet the definition for large or small, it is graded without reference to size.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Set up the Carter dockage tester as follows:

Feed control	#6
Air control	Off
Riddle	None
Top sieve	No. 15 round-hole
Centre sieve	No. 12 round-hole
Bottom sieve	Blank tray
Sieve cleaner control	Off

2. Using a Boerner-type divider, divide the cleaned sample to obtain a representative portion of 250 g.
3. Turn on the Carter dockage tester.
4. Pour the sample into the hopper.
5. After the sample has passed through the machine, turn off the dockage tester.
6. Weigh separately. The percentage by weight determines the size of the lentils in the sample.

If . . .	Then the size is . . .
97% or more of the sample remains on top of a No. 15 round-hole sieve	*Large, for example,* *Lentils, No. 1 CAN Large*
80% or more passes through the No. 12 round-hole sieve	*Small, for example,* *Lentils, No. 1 CAN Small*
otherwise	no size indicated *Lentils, No. 1 CAN*

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of lentils.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

Example
95.0% Lentils, No. 1 CAN
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain. An *order* is issued annually to allow non-registered varieties of Lentils to be graded higher than the lowest statutory grade.

Representative portions for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of lentils for grading, grams

Grading factor	Sample portion size range	
	Minimum	**Maximum**
Ascochyta	25	100
Contrasting colours	50	100
Copper	25	50
Damage	25	100
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Foreign material	50	250
Heated	50	100
Insect parts	working sample	working sample
Odour	working sample	working sample
Peeled, split and broken	25	100
Sclerotinia sclerotiorum	250	working sample
Stained	25	100
Stones	working sample	working sample
Total bleached including copper	25	50
Treated seed	working sample	working sample
Wrinkled	25	50

Grading factors

Ascochyta

Ascochyta is a fungal disease that attacks the lentil plant and seed. Any degree of white fungal growth on the seed is considered damaged. See *Damage*.

Bleached

Bleached seeds have a whitened seed coat that is distinctly faded from the natural red colour of sound lentils. The discoloration must affect the entire seed coat. Lentils having a lighter pink shade that are contrasting with the overall sample are considered sound.

The red lentil colour guide may be used to assist in the determination of bleached seeds.

Broken

See *Peeled, split and broken*.

Colour (CLR)

Lentils, other than Red

Colour is evaluated after the removal of stained and damaged lentils, using approved lentil colour guides.

Description used in grade determinants table	Characteristics
Good natural colour	Lentils that are sound, well matured and have a good natural colour.
Reasonably good natural colour	Lentils with light amounts of adhered soil or lightly discoloured from storage or other natural causes.
Fair colour	Lentils with moderate amounts of adhered soil, or otherwise moderately discoloured from natural causes.
Poor colour	Lentils that do not meet the definition of fair colour, but are without severely adhered soil or are severely discoloured (dark brown).

The term sunburned or oxidation is used to describe the normal discolouration of the seed coat which occurs during storage. The colour may vary from light tan to brown or very dark brown, depending on the duration and conditions of storage.

Lentils, Red

Colour is evaluated by using the following guidelines.

Description used in grade determinant table	Characteristics		
	Copper %	Total bleached including copper %	Adhered Soil
Good natural colour	1	3	Light amounts of adhered soil
Reasonably good natural colour	3	10	Moderate amounts of adhered soil
Fair colour	10	25	Severe amounts of adhered soil
Poor colour	Lentils that do not meet the definition of fair colour.		

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Lentils, Sample Condemned.*

Contrasting colours

Contrasting colours refers to cotyledon colour and significantly different seed coat colour.

- Cotyledons: red cotyledons contrast with yellow cotyledons
- Seed coats: dark-green speckled lentils contrast with green lentils

Copper

Copper seeds have a rust color covering both sides of seed and the entire seed coat. The rust colour is in distinct contrast with the natural red colour of sound lentils.

The red lentil colour guide may be used to assist in the determination of copper seeds.

Damage (DMG)

Damaged lentils may be peeled, split, broken, sprouted, distinctly green, frost damaged, distinctly deteriorated or discoloured by weather or disease, insect damaged, heat damaged or otherwise damaged in a way which materially affects quality.

▲ **Important:** Kernels that are deformed are considered sound unless there is another reason for the damage beyond the deformity.

Note: For green cotyledon varieties, do not assess distinctly green cotyledons as damage. For example: Queen Green variety

Procedure

1. Handpick suspect damaged lentils.
2. Lentils showing some indication of possible internal damage are to be cut for confirmation of damage.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Foreign material*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Lentils, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt seeds are seeds charred or scorched by fire. A cross-section of a fireburnt seed resembles charcoal with numerous air holes. The air holes result in a low weight seed which crumbles easily under pressure.

Procedure

Samples of lentil containing any fireburnt seeds are graded *Lentil, Sample Canada Account Fireburnt.*

Foreign material (FM)

Foreign material includes anything that is not a lentil or part of a lentil.

Frost damage (FR)

Frost damage is normally indicated by a combination of wrinkling and close adherence of the seed coat to the cotyledon. The seed coat may be translucent in appearance, and the cotyledons are brittle in texture. Frost damage is included in the tolerance for *Other Damage.*

Procedures

1. Handpick all frost-damaged lentils.
2. Cut suspect frost-damaged lentils. Frost-damaged seeds are brittle when cut.

Heated (HTD)

Heated lentils are usually dark tan to black in appearance.

If sample contains ...	Then the grading factor is ...
Lentils with tan-coloured cotyledons and a distinct heated odour	*Heated*
Lentils with tan-coloured cotyledons and no odour	*Damage*

Procedures

1. Handpick suspect heated lentils.
2. Cut suspect seeds to expose the cotyledons. Heated lentils have tan-coloured cotyledons.
3. Heated seeds of other grains are included in the tolerance for *Heated.*

Insect parts (I PARTS)

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is ...	Then the grade is ...
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Lentils, Sample Canada Account Odour*
An excessive heated odour	*Lentils, Sample Canada Account Heated*
An excessive fireburnt odour	*Lentils, Sample Canada Account Fireburnt*

Other Damage (ODMG)

Other damage is any damage other than heated, or peeled, split and broken.

Peeled, split and broken (PLDSPLTBKN)

Peeled, split and broken includes lentils which are otherwise sound but which are less than three-quarters of whole seeds or where less than one-half of the seed coat is intact.

Lentils with cracked or clipped seed coats are considered sound when the cotyledons are firmly held together.

Rime (RIME)

Rime is the adhered lining of the seed pod. It is included in the general tolerance for Damage.

If the rime . . .	Then the grading is . . .
Completely and densely covers the lentils	*Damaged*
Is sparse enough to expose the soundness of the lentil	*Sound*—the rime is considered in the general appearance of the sample

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Split

See *Peeled, split and broken*.

Sprouted (SPTD)

Lentils are considered sprouted when the seed coat splits and the primary root emerges from between the cotyledons or the primary root has been broken off but there is clear evidence of sprouting. Sprouted is considered in the tolerance for *Other Damage*.

Stained (STND)

Stained lentils includes (only applies to lentils, other than red)

- Mottled seeds—seeds with a significant number of distinct spots on the seed coat
- Water spot—seeds with distinct brown discolourations on the seed coat
- Ascochyta—seeds with dark-coloured lesions on the seed coat. Seeds with white fungal growth are also considered as damaged. See *Ascochyta*.
- Blue-black—seeds of green lentils with significant blue-black discolouration of the seed coat. Seeds of varieties of lentils with dark-green speckled or coloured seed coats are considered as *Contrasting colours*.

Procedure

Refer to digitally produced colour prints of stained lentils as a grading guide

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Lentils, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Lentils, Sample Canada Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Lentils, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Lentils, Canada Red

Grade name	Stones %
No. 1 Canada Red	0.10
No. 2 Canada Red	0.2
Extra No. 3 Canada Red	0.2
No. 3 Canada Red	0.2

Basic grade:......................... *Lentils, No. 1 Canada Red*

If the above sample contained	Grade in western Canada
0.2% stones	*Lentils, Rejected No. 1 Canada Red Account Stones*
1.0% stones	*Lentils, Rejected No. 1 Canada Red Account Stones*
3.0% stones	*Lentils, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Lentils, Canada Red

Grade name	Stones %
No. 1 Canada Red	0.10
No. 2 Canada Red	0.2
Extra No. 3 Canada Red	0.2
No. 3 Canada Red	0.2

Basic grade:......................... *Lentils, No. 1 Canada Red*

If the above sample contained	Grade in eastern Canada
0.2% stones	*Lentils, No. 2 Canada Red*
1.0% stones	*Lentils, Sample Canada Red Account Stones*
3.0% stones	*Lentils, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Lentils, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspected Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety

On written request, the lentil variety forms part of the grade name, for example, No. 1 Canada, Laird.

▲ **Important**: State "Varietal purity not guaranteed" in the remarks section of grading certificates.

Wrinkled

Wrinkled seeds are characterized by a seed surface that has sharp ridges and pronounced depressions that could also be described as seed coat folds and indents. Wrinkles may be evident only on one side of the lentil.
Lentils that only have dimpled seed coat or folds restricted only to the outside ring of the seed are considered sound.

The red lentil wrinkled guide may be used to assist in the determination of wrinkled seeds.

Note: Wrinkled only applies to red lentils

Primary and export grade determinants tables

Lentils, Canada, other than Red (CAN)

Grade name	Standard of quality	Contrasting colours	Stained %	Damage			
	Degree of soundness			Heated %	Peeled, split and broken %	Other damage %	Total %
No. 1 Canada	Uniform size, good natural colour	0.2	1	0.2	2.0	1.0	2.0
No. 2 Canada	Uniform size, reasonably good natural colour	0.5	4	0.5	3.5	2	3.5
Extra No. 3 Canada	Uniform size, fair colour	2	7	0.5	5	5	5
No. 3 Canada	Poor colour	3	No limit	1	10	10	10
Grade, if No. 3 specs not met		*Lentils, Sample Canada Account Contrasting Colours*		*Lentils, Sample Canada Account Heated*	*Lentils, Sample Canada Account Damaged*	*Lentils, Sample Canada Account Damaged*	*Lentils, Sample Canada Account Damaged*

Grade name	Foreign material						
	Ergot %	Excreta %	Insect parts %	Sclerotinia %	Stones %	Other foreign material %	Total %
No. 1 Canada	0.05	0.01	0.02	0.05	0.10	0.2	0.2
No. 2 Canada	0.05	0.01	0.02	0.05	0.2	0.5	0.5
Extra No. 3 Canada	0.05	0.01	0.02	0.05	0.2	0.5	0.5
No. 3 Canada	0.05	0.01	0.02	0.05	0.2	1	1
Grade, if No. 3 specs not met	*Lentils, Sample Canada Account Ergot*	*Lentils, Sample Canada Account Excreta*	*Lentils, Sample Canada Account Admixture*	*Lentils, Sample Canada Account Admixture*	2.5% or less—*Lentils, Rejected (grade) Account Stones*, or *Lentils, Sample Canada Account Stones* Over 2.5%—*Lentils, Sample Salvage*	*Lentils, Sample Canada Account Admixture*	*Lentils, Sample Canada Account Admixture*

Note: Upon written request, the variety name will be added to the grade name and the statement "Varietal purity not guaranteed" shown in the remarks section of any certificate issued.

Lentils, Canada Red (CAN)

	Standard of quality				Damage					
		Colour								
Grade name	**Degree of soundness**	**Copper %**	**Total bleached including copper %**	**Contrasting colours %**	**Heated %**	**Peeled, split and broken %**	**Other damage %**	**Total %**	**Wrinkled %**	**Total damage including wrinkled %**
No. 1 Canada	Uniform size, good natural colour	1	3	0.2	0.2	2.0	1.0	2.0	2.0	4
No. 2 Canada	Uniform size, reasonably good natural colour	3	10	0.5	0.5	3.5	2	3.5	5.0	8
Extra No. 3 Canada	Uniform size, fair colour	10	25	2	0.5	5	5	5	N/A	N/A
No. 3 Canada	Poor colour	No limit	No limit	3	1	10	10	10	N/A	N/A
Grade, if No. 3 specs not met				*Lentils, Sample Canada Red Account Contrasting Colours*	*Lentils, Sample Canada Red Account Heated*	*Lentils, Sample Canada Red Account Damaged*	*Lentils, Sample Canada Red Account Damaged*	*Lentils, Sample Canada Red Account Damaged*		

	Foreign material						
Grade name	**Ergot %**	**Excreta %**	**Insect parts %**	**Sclerotinia %**	**Stones %**	**Other foreign material %**	**Total %**
No. 1 Canada	0.05	0.01	0.02	0.05	0.10	0.2	0.2
No. 2 Canada	0.05	0.01	0.02	0.05	0.2	0.5	0.5
Extra No. 3 Canada	0.05	0.01	0.02	0.05	0.2	0.5	0.5
No. 3 Canada	0.05	0.01	0.02	0.05	0.2	1	1
Grade, if No. 3 specs not met	*Lentils, Sample Canada Red Account Ergot*	*Lentils, Sample Canada Red Account Excreta*	*Lentils, Sample Canada Red Account Admixture*	*Lentils, Sample Canada Red Account Admixture*	2.5% or less— *Lentils, Rejected (grade) Account Stones*, or *Lentils, Sample Canada Red Account Stones* Over 2.5%—*Lentils, Sample Salvage*	*Lentils, Sample Canada Red Account Admixture*	*Lentils, Sample Canada Red Account Admixture*

Note: Upon written request, the variety name will be added to the grade name and the statement "Varietal purity not guaranteed" shown in the remarks section of any certificate issued.

Export shipments

Shipments can be commercially clean or not commercially clean.

Commercially clean (CC)

Shipments are considered commercially clean when they contain 0.2% or less by weight of dockage material. No dockage is reported.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are allowed only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator
- Less a direct deduction of up to 0.2% to take into account the buildup of attritional material for direct shipments only.

Processed shipments

For samples representing processed shipments from other than terminal elevators, dockage is reported to the nearest 0.1% and consists of the following

- Material that remains on top of the riddle, other than whole lentils which are handpicked and returned to the cleaned sample
- Material that passes through the selected sieve
- Material removed by aspiration
- Small broken lentils and portions of lentils whose weight exceeds 0.2% of the sample weight and which are removable through the No. 10 round-hole sieve and by aspiration

Grading

Where there are no export specifications, the primary specifications are used.

19. Beans

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Classes, types and varieties

Classes

There are numerous classes of beans; for example, cranberry beans, blackeye beans, black turtle beans. The class of beans forms part of the grade name; for example, Beans, No. 1 Canada Cranberry.
The method of determining the class of a bean is by the size, shape and colour of the bean.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%. Dockage is assessed only on unprocessed samples of beans.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this chapter.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Beans, Sample Canada (class) Account Fireburnt*
- *Beans, Sample Salvage*
- *Beans, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazaradous substances.

Dockage is assessed only on unprocessed samples of beans. All foreign material in processed samples is assessed as grading factors.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
2. Choose the appropriate hand sieve for the size of the bean.

   No. 8 slotted
   No. 9 slotted
   No. 11 slotted
3. Sieve the samples over the appropriate slotted sieve, using approximately 250 g at a time, to remove all readily removable material.
4. Handpick the portion remaining on top of the slotted sieve to remove all coarse vegetable matter such as pods, stems, straw, thistle tops.

   ▲ **Important:** Do not remove mineral matter, ergot, sclerotinia, weed seeds or other grains.
5. Determine dockage. Use the list under *Composition of dockage*.

Composition of dockage

Dockage includes

- All material removed by sieving or handpicking or both, as defined in the previous section
- Soft earth pellets, which are pellets that crumble under light pressure, including earth pellets, fertilizer pellets, or pellets of any non-toxic material of similar consistency
- In unprocessed samples, mudballs handpicked from the cleaned sample

Commercially clean (CC)

Primary samples are considered commercially clean when they contain no dockage material.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
    - The percentage by gross weight to the nearest 0.1% and the grade of beans.
    - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
    - The percentage of dockage.

Example
95.0% Beans No. 1 CAN Cranberry
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain. An *order* is issued annually to allow non-registered varieties of Beans to be graded higher than the lowest statutory grade.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of beans for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Contrasting classes	250	working sample
Damage	100	500
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Foreign material	250	working sample
Heated, rotted, mouldy	250	working sample
Insect parts	working sample	working sample
Odour	working sample	working sample
Other classes of beans that blend	100	250
Sclerotinia sclerotiorum	500	working sample
Splits	100	working sample
Stones	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Adhered soil

Adhered soil is soil which clings to beans.

Procedures

- Completely covered beans are called mudball beans. See *Mudball beans*.
- Otherwise, assess the amount of adhered soil against the colour standard.

Broken (BKN)

See *Splits*

Classes

There are numerous classes of beans; for example, cranberry beans, blackeye beans, turtle beans. The class of beans forms part of the grade name; for example, *Beans, No. 1 Canada Cranberry*.

Colour (CLR)

Colour is evaluated on the cleaned sample after the removal of splits and damaged beans. There is no numeric tolerance for colour. It is included in the evaluation of the standard of quality of the sample.

Standard of quality	Description (for grading)
Good natural colour	Beans may be slightly dull, slightly immature or have lightly adhered soil.
Reasonably good colour	Beans are moderately immature, with lightly adhered soil, or are lightly stained, or are lightly discoloured from storage.
Fairly good colour	Beans have moderately adhered soil or are stained, or moderately discoloured from storage.
Off colour	Beans cannot be considered of fairly good colour.

Sunburned or oxidized

In assessing colour which does not meet grade standards, you may also use the term *Sunburned or oxidized*, which is a normal discolouration of the seed coat occurring during storage. The colour may vary from light tan to brown or very dark brown, depending on the duration and conditions of storage.

Procedure

Colour is assessed against the colour standard for the grade.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "*Canada Grain Act*" as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Beans, Sample Condemned*.

Contrasting classes (CON CL)

Beans of another class that contrast in colour, size or shape to the predominant beans in a sample are considered to be of a contrasting class.

Damage (DMG)

Damaged beans include

- Whole, split, or broken beans that are sprouted, very immature, perforated, distinctly deteriorated or discoloured by weather or disease.
- Beans that are otherwise damaged in a way that seriously affects appearance or quality. This includes mudball beans in processed beans.

Procedures

Beans showing some indication of possible internal damage are to be cut for confirmation of damage.

▲ **Important:** Damage is the most detrimental grading factor.
Refer to the Order of Precedence.

Earth pellets (EP)

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Beans, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt beans are beans charred or scorched by fire. A cross-section of a fireburnt bean resembles charcoal with numerous air holes. The air holes result in a low weight bean which crumbles easily under pressure.

Procedure

Samples of beans containing any fireburnt seeds are graded *Beans, Sample Canada (class) Account Fireburnt.*

Foreign material (FM)

This includes any material other than beans or split beans not removed in cleaning.

Heated (HTD)

Heated, rotted, and mouldy are included in the same tolerance.

Pea beans

Heating is indicated by a dull seed coat varying from cream to mahogany in colour. The colour is more intense in the hilum area. When viewed in cross-section, the cotyledons vary in colour from tan to dark brown. Very light tan cotyledons are considered damaged rather than heated.

Red kidney beans

Heating is indicated by a dull seed coat, dark red to black in colour.

Procedure

- To determine the degree of damage, split the bean. Do not cut it crosswise.
- Heated seeds of other grains are included in the tolerance for *Heated.*

Insect parts (I PARTS)

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

Magnesium spot

Magnesium spot is a black spot penetrating the cotyledon, most commonly found in cranberry beans. Affected beans are considered damaged.

Procedures

Initially separate all beans where there is a "suspicion" of internal damage. This "suspicion" will be based on external characteristics or discolouration on the surface of the beans which indicates that the cotyledons may be damaged. Only suspect beans are to be cut and assessed for damage.

Mouldy (MLDY)

Mouldy beans are characterized by the presence of dark blue exterior moulds that develop in machine-damaged crevices. Light and dark red kidney beans may develop yellow to black interior moulds in the concave centre area. Heated, rotted, and mouldy are included in the same tolerance.

Mudball beans

Mudball beans are beans that are completely covered with caked-on mud.

- In processed samples, mudball beans are considered *Damage*.
- In unprocessed samples, mudball beans are considered dockage.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	Then the grade is . . .
An objectionable odour, not heated or fireburnt	*Beans, Sample Canada Account Odour*
A heated odour	*Beans, Sample Canada Account Heated*
A fireburnt odour	*Beans, Sample Canada Account Fireburnt*

Other classes of beans that blend (OCLBB)

Classes of beans that blend are sound beans of other classes which are similar in colour, size and shape to the predominant beans in a sample.

Rotted (ROT)

Rotted beans are whole beans or pieces of beans that are visibly in advanced stages of decomposition and that feel spongy under pressure. Heated, rotted, and mouldy are included in the same tolerance.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered *Stones*. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Earth pellets are classed as foreign material.

Splits (SPLTS)

Splits include split beans, broken pieces of beans that are less than three-quarters of whole kernels, and halves of beans that are loosely held together by cracked seed coats.

▲ **Important:** Splits do not include beans that are otherwise damaged. In other words, if a split is damaged, it is graded as *Damage*, not as splits.

Procedures

Use a slotted sieve to help separate splits. Return to the sample any whole beans which pass through the sieve.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Beans, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Beans, Sample Canada Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Beans, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Beans, Canada Cranberry, Blackeye or Yelloweye Canada

Grade name	Stones %
Extra No. 1 Canada	Nil
No. 1 Canada	0.05
No. 1 Canada Select	0.05
No. 2 Canada	0.1
No. 3 Canada	0.2
No. 4 Canada	0.5

Basic grade:.......................... *Beans, No. 2 Canada Cranberry*
Reason for basic grade:....... 0.2% Heated

If the above sample contained	Grade in western Canada
0.2% stones	*Beans, Rejected No. 2 Canada Cranberry Account Stones*
1.0% stones	*Beans, Rejected No. 2 Canada Cranberry Account Stones*
3.0% stones	*Beans, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Beans, Canada Cranberry, Blackeye or Yelloweye Canada

Grade name	Stones %
Extra No. 1 Canada	Nil
No. 1 Canada	0.05
No. 1 Canada Select	0.05
No. 2 Canada	0.1
No. 3 Canada	0.2
No. 4 Canada	0.5

Basic grade:.......................... *Beans, No. 2 Canada Cranberry*
Reason for basic grade:....... 0.2% Heated

If the above sample contained	Grade in eastern Canada
0.2% stones	*Beans, No. 3 Canada Cranberry*
1.0% stones	*Beans, Sample Canada Cranberry Account Stones*
3.0% stones	*Beans, Sample Salvage*

Treated seed and other chemical chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Beans, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Variety

Beans are graded without reference to variety

Special analyses

Upon request, samples may be analyzed for other factors. The shipper of the beans indicates which factors are to be analyzed and which sieves to use.

Split beans

Use a slotted sieve to help in separating splits from whole beans.

Record all percentages to two decimal places.

Factor	Minimum representative portion to analyse g
Foreign material	500
Sound whole or sound splits	100
Damaged whole or damaged splits	100

Cracked seed coats (CSDC)

Cracked seed coats include
- Beans with any cracked seed coats
- Beans with a piece of seed coat missing

Beans with a seed coat punctured by insect or other means

Primary and export grade determinants tables

Pea Beans, Canada (CAN)

Grade name	Standard of quality	Other classes that blend %
Extra No. 1 Canada	Uniform size, good natural colour	1
Canada No. 1 Select	Fairly good colour	1
No. 1 Canada	Reasonably good colour	1
No. 2 Canada	Fairly good colour	5
No. 3 Canada	Fairly good colour	5
No. 4 Canada	Off-colour	5
Grade, if No. 4 specs not met		*Pea Beans, Sample Canada Account Other Classes That Blend*

	Foreign material									
Grade name	Ergot %	Excreta %	Insect parts %	Sclerotinia %	Stones, shale or similar material %	Total %	Contrasting classes %	Heated, rotted, mouldy %	Total damage, foreign material, and contrasting classes %	Total damage, including splits, foreign material and contrasting classes %
Extra No. 1 Canada	0.05	0.01	0.02	0.05	0.01	0.05	0.1	Nil	1.0	1.0
Canada No. 1 Select	0.05	0.01	0.02	0.05	0.01	0.05	0.1	0.20	1.5	2.0
No. 1 Canada	0.05	0.01	0.02	0.05	0.05	0.10	0.1	0.10	1.5	2.0
No. 2 Canada	0.05	0.01	0.02	0.05	0.10	0.20	1	0.20	3	4
No. 3 Canada	0.05	0.01	0.02	0.05	0.20	0.5	1	0.3	5	6
No. 4 Canada	0.05	0.01	0.02	0.05	0.20	0.5	1	1.0	8.5	10
Grade, if No. 4 specs not met	*Pea Beans, Sample Canada Account Ergot*	*Pea Beans, Sample Canada Account Excreta*	*Pea Beans, Sample Canada Account Admixture*	*Pea Beans, Sample Canada Account Admixture*	2.5% or less—*Pea Beans, Rejected (grade) Account Stones*, or *Pea Beans, Sample Canada Account Stones* Over 2.5%—*Pea Beans, Sample Salvage*	*Pea Beans, Sample Canada Account Admixture*	*Pea Beans, Sample Canada Account Contrasting Classes*	*Pea Beans, Sample Canada Account Heated* or *Account Mouldy Kernels*	*Pea Beans, Sample Canada Account (reason)*	*Pea Beans, Sample Canada, Account (reason)*

Beans, Canada Cranberry, Blackeye or Yelloweye (CAN)

Grade name	Standard of quality	Other classes that blend %
Extra No. 1 Canada	Uniform size, good natural colour	1
No. 1 Canada	Reasonably good colour	3
No. 1 Canada Select	Fairly good colour	3
No. 2 Canada	Fairly good colour	5
No. 3 Canada	Fairly good colour	10
No. 4 Canada	Off-colour	15
Grade, if No. 4 specs not met		*Beans, Sample Canada (class) Account Other Classes That Blend*

Grade name	Foreign material						Contrasting classes %	Heated, rotted, mouldy %	Total damage, foreign material, and contrasting classes %	Total damage, including splits, foreign material and contrasting classes %
	Ergot %	Excreta %	Insect parts %	Sclerotinia %	Stones, shale or similar material %	Total %				
Extra No. 1 Canada	0.05	0.01	0.02	0.05	Nil	0.05	1.0	Nil	1.0	1.0
No. 1 Canada	0.05	0.01	0.02	0.05	0.05	0.10	1.5	0.10	1.5	3.5
No. 1 Canada Select	0.05	0.01	0.02	0.05	0.05	0.10	1.5	0.10	1.5	3.5
No. 2 Canada	0.05	0.01	0.02	0.05	0.10	0.20	3	0.20	3	5.5
No. 3 Canada	0.05	0.01	0.02	0.05	0.20	0.5	5	0.3	5	7.5
No. 4 Canada	0.05	0.01	0.02	0.05	0.50	1.0	8.5	1.0	8.5	10
Grade, if No. 4 specs not met	*Beans, Sample Canada (class) Account Ergot*	*Beans, Sample Canada (class) Account Excreta*	*Beans, Sample Canada (class) Account Admixture*	*Beans, Sample Canada (class) Account Admixture*	2.5% or less—*Beans, Rejected (grade) (class) Account Stones*, or *Beans, Sample Canada (class) Account Stones* Over 2.5%—*Beans, Sample Salvage*	*Beans, Sample Canada Account Admixture*	*Beans, Sample Canada (class) Account Contrasting Classes*	*Beans, Sample Canada (class) Account Heated* or *Account Mouldy Kernels*	*Beans, Sample Canada (class) Account (reason)*	*Beans, Sample Canada (class) Account (reason)*

Note: The class name is added to the grade name.

Beans, Canada, other than Cranberry, Blackeye, Yelloweye or Pea Beans (CAN)

Grade name	Standard of quality	Other classes that blend %
Extra No. 1 Canada	Uniform size, good natural colour	1
No. 1 Canada	Reasonably good colour	3
No. 1 Canada Select	Fairly good colour	3
No. 2 Canada	Fairly good colour	5
No. 3 Canada	Fairly good colour	10
No. 4 Canada	Off-colour	15
Grade, if No. 4 specs not met		*Beans, Sample Canada (class) Account Other Classes That Blend*

	Foreign material									
Grade name	Ergot %	Excreta %	Insect parts %	Sclerotinia %	Stones, shale or similar material %	Total %	Contrasting classes %	Heated, rotted, mouldy %	Total damage, foreign material, and contrasting classes %	Total damage, including splits, foreign material and contrasting classes %
Extra No. 1 Canada	0.05	0.01	0.02	0.05	Nil	0.05	1.0	Nil	1.0	1.0
No. 1 Canada	0.05	0.01	0.02	0.05	0.05	0.10	1.5	0.10	1.5	2.0
No. 1 Canada Select	0.05	0.01	0.02	0.05	0.05	0.10	1.5	0.10	1.5	2.0
No. 2 Canada	0.05	0.01	0.02	0.05	0.10	0.20	3	0.20	3	4
No. 3 Canada	0.05	0.01	0.02	0.05	0.20	0.5	5	0.3	5	6
No. 4 Canada	0.05	0.01	0.02	0.05	0.50	1.0	**8.5**	1.0	**8.5**	10
Grade, if No. 4 specs not met	*Beans, Sample Canada (class) Account Ergot*	*Beans, Sample Canada (class) Account Excreta*	*Beans, Sample Canada (class) Account Admixture*	*Beans, Sample Canada (class) Account Admixture*	2.5% or less—*Beans, Rejected (grade) (class) Account Stones*, or *Beans, Sample Canada (class) Account Stones* Over 2.5%—*Beans, Sample Salvage*	*Beans, Sample Canada Account Admixture*	*Beans, Sample Canada (class) Account Contrasting Classes*	*Beans, Sample Canada (class) Account Heated* or *Account Mouldy Kernels*	*Beans, Sample Canada (class) Account (reason)*	*Beans, Sample Canada (class) Account (reason)*

Note: The class name is added to the grade name.

Export shipments

Shipments can be commercially clean or not commercially clean.

Commercially clean (CC)

Shipments are considered commercially clean when they contain no dockage material.

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material for direct shipments only.

Grading

Beans on export are graded in accordance with primary standards and specifications.

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Classes, types and varieties

Soybeans may be yellow, green, brown or black. Colour is part of the grade name; for example, *Soybeans, No. 1 Canada Yellow*.

The method for determining the colour of a soybean is by seed coat colour.

Determination of commercially clean

Dockage is not assessed on soybean samples that meet the commercially clean specifications set out in the Soybean Export Shipments section. All samples must be analyzed to determine if they meet commercial cleanliness standards prior to dockage being assessed. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.2% of roughage material then dockage will be assessed using the procedures defined under *Determination of Dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed using the procedures, and applying the specifications, listed below.

1. Using a Boerner-type divider, divide the sample to obtain a representative portion.
    - Official samples shall be at least 1 kg.
    - Unofficial samples shall be at least 1 kg.
2. Place approximately 250 grams of the sample at a time on the No. 8 round hole sieve.
3. Move the sieves from left to right 30 times using a sifting motion. One complete motion is approximately 10 cm from the center to one side, back to the center, approximately 10 cm to the other side and back to the center.
4. Separate broken soybean from the other material passing through the No. 8 round hole sieve.

    Note: Soybean hulls are included in the material other than broken soybeans.
5. The material other than broken soybeans is weighed and the percentage calculated to determine if it meets the commercially clean specification for material other than broken soybeans through the #8 round hole sieve. (Column 1 of the commercially clean specification table)
6. Handpick the entire sample remaining on top of the # 8 round hole sieve for any roughage material and hulls.
7. The roughage and hulls remaining on the # 8 round hole sieve is weighed and the percentage calculated to determine if it meets the commercial clean specification for roughage and hulls. (Column 2 of the commercially clean specification table)
8. The percentage of roughage and hulls and the percentage of material other than broken soybeans passing through the # 8 round hole sieve are added together to determine if the total meets the commercially clean specification. (Column 3 of the commercially clean specification table)
9. The broken soybeans passing through the # 8 round hole sieve are weighed and the percentage calculated to determine if it meets the commercially clean specification. (Column 4 or column 5 of the commercially clean specification table.

Should the percentage concentration of any factors determined in steps 1 through 9 exceed the specifications set out in columns 1 through 5 of the commercially clean specification table the sample will be considered to be not commercially clean.

Dockage will be assessed on samples determined to be not commercially clean using the procedures outlined under *Determination of Dockage*.

Definition of commercially clean specifications for soybeans

Grade name	1	2	3 (1+2)	4	5
	Material other than broken soybeans through the #8 round hole sieve.	Roughage and Hulls	Total roughage, hulls and material other than broken soybeans through the #8 round hole sieve.	Broken Soybeans through the #8 round hole sieve	
				Not direct exports	Direct exports
Soybeans 1,2,3,4,5 Canada	0.1%	0.2%	0.2%	0.75%	1.0%

Determination of dockage

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples graded as

- *Soybeans, Sample Canada (colour) Account Fireburnt*
- *Soybeans, Sample Salvage*
- *Soybeans, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Samples that are commercially clean do not go through the Carter dockage tester.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1kg.
   - Unofficial samples shall be at least 1kg.
2. Sieve the samples over the No. 8 round-hole hand sieve, using approximately 250 g at a time, to remove all readily removable material.
3. Set up the Carter dockage tester as follows:

Feed control	#10
Air control	#7
Riddle	none
Top sieve	blank tray
Centre sieve	none
Bottom sieve	none
Sieve cleaner control	off

4. Turn on the Carter dockage tester.
5. Pour the sample into the hopper.
6. After the sample has passed through the machine, turn off the machine.
7. Lightly snap the retainer rod of the aspiration pan to loosen material gathered on the air screen.

8. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material passing through the No. 8 round-hole sieve
- Up to 10.0% by weight of soft earth pellets handpicked from the sample
- Stems, pods, hulls, loose soybean seed coats, and coarse vegetable matter removed through aspiration with the Carter dockage tester, or handpicked from the sample.

▲ **Important:** Return all pieces of soybeans or whole soybeans, sclerotinia, ergot, weed seeds or other grains removed by aspiration to the sample where they are assessed as grading factors.

Aspiration is used only as an aid to help speed up the removal of lightweight dockage material from the sample.

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of soybeans.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Soybeans, No. 1 CAN, Yellow
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of net weight.

Hazardous substances in samples

Wear gloves to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portions for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of soybeans for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Colour	working sample	working sample
Damage	50	250
Downy mildew	100	250
Ergot	500	working sample
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Foreign material	100	500
Heated, mouldy, rancid	50	500
Immature	50	250
Odour	working sample	working sample
Other colours or bicoloured other than for mixed soybeans	100	working sample
Sclerotinia sclerotiorum	500	working sample
Soft earth pellets	working sample	working sample
Splits, seed coats	250	working sample
Stained, mottled	working sample	working sample
Stones	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Colour (CLR)

Colour is evaluated on the cleaned sample after the removal of damaged seeds. Colour is assessed against the *standard of quality* by using the applicable standard sample or guide photos published for the grade.

Note: Yellow soybeans with green coloured hulls, but are not *immature*, shall be graded no lower than *Soybeans, No. 2 Canada Yellow*.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Soybeans, Sample Condemned*.

Damage (DMG)

Damaged soybeans include those which are sprouted, frost-damaged, shriveled, ground-damaged, insect damaged, immature, or otherwise unsound.

Procedures

Soybeans showing some indication of possible internal damage are to be cut for confirmation of damage.

Downy mildew (DWNY MIL)

Downy mildew is a superficial coating of downy or powdery fungal growth. An individual soybean is considered affected only if all of the fungal growth could be pulled together and the growth covers 50% or more of the surface area of the soybean.

Earth pellets

- Hard earth pellets are pellets that do not crumble under light pressure. See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure. See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Ergot attacks cereal crops and is not usually present in soybeans, which are a broadleaf crop.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Soybeans, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt soybeans are seeds charred or scorched by fire. A cross-section of a fireburnt seed resembles charcoal with numerous air holes. The air holes result in a low weight seed which crumbles easily under pressure.

Procedure

Samples of soybeans containing fireburnt seeds are graded as *Soybeans, Sample Canada Account Fireburnt.*

Foreign material (FM)

Foreign material includes any material other than whole soybeans or split soybeans left in the sample after the removal of dockage.

Foreign material other than grain (FMXGRN)

Foreign material other than grain does not include ergot or stones, but does include

- Large weed seeds that did not pass through the No. 8 round-hole sieve
- Soft earth pellets which crumble under light pressure
- Soft fertilizer pellets
- Any other non-toxic material of a similar consistency
- Sclerotinia

Frost (FR)

Frost-damaged soybeans, when cut in cross-section, are

- Soybeans whose cotyledons are green or greenish-brown with a glassy wax-like appearance are considered frost-damaged.
- Seeds whose cotyledon are yellow or have just a halo of green around the outside of the cotyledon are considered sound, even if they are superficially affected by weathering.

See *Damage*

Heated (HTD)

- Soybeans with a light to dark brown cotyledon when cut in cross section are considered heated.
- Soybeans with a very light tan cotyledon when cut in cross section are considered damaged. See *Damage*.
- Heated seeds of other grains are included in the tolerance for *Heated*.

Hulls (HULLS)

See *Seed coats*.

Immature (IM)

Immature damaged soybeans are characterized by a green exterior appearance in conjunction with green discolouration penetrating the cotyledon. Examination of the cotyledons is determined by cutting the soybeans in cross section. For grading purposes, immature damaged soybeans are considered as part of the "Total Damage" grade specification.

Soybeans that are green in appearance and have no discolouration of the cotyledon or just a halo of green around the outside of the cotyledon are to be assessed against the overall colour of the sample and are not to be graded lower than *Soybeans, No. 2 Canada Yellow*.

Insect Damage (I DMG)

Insect damaged kernels are characterized by a perforation of the seed coat in conjunction with a discoloration penetrating into the cotyledon.

See *Damage*

Mottled kernels

See *Stained and mottled.*

Mouldy (MLDY)

Mouldy soybeans are wrinkled and misshapen, and range in colour from medium to dark brown. Large areas of the affected bean are superficially covered with a grey mould. Mouldy beans often have a spongy texture and usually give off an unpleasant odour. They are included in the tolerance for *Heated.*

Mudball soybean

A soybean completely covered with caked-on mud is considered damaged.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

Grains grading No. 1 through 3 must have a natural odour. A sample would have to grade No. 4 for Damage before it could have a slight odour associated with low quality soybeans.

If odour is the grade determinant and there is . . .	**Then the grade is . . .**
If there is a distinct unnatural or objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Soybean, Sample Canada (colour) Account Odour*
A heated odour	*Soybean, Sample Canada (colour), Heated*
A fireburnt odour	*Soybean, Sample Canada (colour), Fireburnt*

ther colours or bicoloured other than for mixed soybeans (OCLRRBICLROTMXDSYB)

- Mixed soybeans are samples containing bicoloured soybeans or soybeans of another colour.
- Bicoloured soybeans are yellow or green soybeans with black or brown pigmented streaks or blotches in the seed coats.

Other grains (OGS)

All grains other than soybeans that remain in the sample after cleaning are considered other grains.

Pokeweed stain

Pokeweed stain is a bright red staining of the soybean seed coat caused by the sap of the pokeweed berry. In some cases, the staining may appear similar to pesticide treated seeds of soybeans.

▲ **Important:** Do not confuse pokeweed stain with pesticide treated seed or contaminated grain.

Rancid

Soybeans in various stages of rancidity are characterized by a deep pink discolouration on the seed coat and varying degrees of discolouration of the cotyledon.

Seeds having a deep pink discolouration on the seed coat are cut and, based upon the extent of discolouration of the cotyledon, assessed as follows:

Discolouration of cotyledon	Assess as
No discolouration of cotyledon to slight discolouration just below seed coat.	Considered in the evaluation of colour.
Pink discolouration of cotyledon greater than just below the seed coat level but not throughout the entire seed.	Considered as *Damage.*
Pink discolouration extends throughout cotyledon.	Considered rancid and included in tolerance for *Heated.*

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior. Sclerotinia is included in *Foreign material other than grain* for grade determination.

Seed coats

- In unprocessed samples, loose seed coats are assessed as dockage.
- In commercially clean samples, loose seed coats are assessed as *Splits.*

Shrivelled

If the soybean is shrivelled, small and flat, it has no oil value and is considered *Damaged.*

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Procedure

- Earth pellets may be removed as dockage. See *Normal cleaning procedures*.
- If soft earth pellets are over 10.0% of the gross weight of the sample, they become a grading factor, included in the tolerance for *Foreign material other than grain*.

1. Return the pellets to the sample.
2. Handpick soft earth pellets from a representative portion of the cleaned sample.
3. If soft earth pellets are the grade determinant, grade the sample *Soybeans, Sample Canada (colour, Account Admixture*.

Splits (SPLTS)

Splits include split soybeans, broken seeds that are less than three-quarters of the whole seed, and cotyledons that are loosely held together by the seed coat.

Procedure

1. Any slotted hand sieve may be used to help separate splits from the sample.
2. Handpick any small whole soybeans that pass through the sieve and return them to the sample.
3. Handpick the remaining splits in the sample and add them to those removed by sieving.
4. Determine the total percentage by weight of splits.

Sprouted

If a soybean shows evidence of sprouting, it is *Damaged*.

Stained and mottled (STND)

Staining or mottling on the surface is caused by weather, dirt, weed stain, or disease. If the soybeans are not damaged or discoloured internally, they are considered sound. See *Pokeweed stain*.

Limits are visible in the Canada standard samples, and are defined under standard of quality as

Good natural colour	Canada No. 1
Slightly stained	Canada No. 2
Stained	Canada No. 3
Badly stained	Canada No. 4 or 5

Procedure

Evaluate the stain or mottling according to its effect on the general appearance of the sample.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Soybeans, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Soybeans, Sample Canada (colour) Account Stones*.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Soybeans, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Soybeans, Canada

Grade name	**Stone %**
No. 1 Canada	Nil
No. 2 Canada	0.03
No. 3 Canada	0.1
No. 4 Canada	0.1
No. 5 Canada	0.1

Basic grade:.........................*Soybeans, No. 2 Canada Yellow*
Reason for basic grade:....... 0.2% Heated

If the above sample contained	**Grade in Western Canada**
0.06% stones	*Soybeans, Rejected No. 2 Canada Yellow*
0.3% stones	*Soybeans, Rejected No. 2 Canada Yellow*
3.0% stones	*Soybeans, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Soybeans, Canada

Grade name	**Stones %**
No. 1 Canada	Nil
No. 2 Canada	0.03
No. 3 Canada	0.1
No. 4 Canada	0.1
No. 5 Canada	0.1

Basic grade:.........................*Soybeans, No. 2 Canada Yellow*
Reason for basic grade:....... 0.2% Heated

If the above sample contained	**Grade in Eastern Canada**
0.08% stones	*Soybeans, No. 3 Canada Yellow*
1.0% stones	*Soybeans, Sample Canada Yellow Account Stones*
3.0% stones	*Soybeans, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Soybeans, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

▲ **Important:** Do not confuse pesticide treated seed with pokeweed stain, which is similar.

Variety

Soybeans are graded without reference to variety.

Special analyses

Upon request, samples may be analyzed for other factors. The shipper of the soybeans indicates which factors are to be analyzed and which sieves to use.

Hilum colour (white hilum)

Hilum colour is not a grading factor.

Handpick a representative portion of not less than 100 g of the cleaned sample to determine the percentage by weight of Hilum colour.

Sizing

Analyse a representative portion of not less than 500 g of the cleaned sample. The shipper specifies the sieve size.

Primary and export grade determinants tables

Soybeans, Canada Yellow, Green, Brown, Black or Mixed (CAN)

Grade name	Standard of quality	
	Minimum test weight kg/hL (g/0.5 L)	Degree of soundness
No. 1 Canada	70 (356)	Cool, natural odour, good natural colour
No. 2 Canada	68 (346)	Cool, natural odour, may be slightly stained
No. 3 Canada	66 (335)	Cool, natural odour, may be stained
No. 4 Canada	63 (320)	Cool, may be badly stained
No. 5 Canada	59 (298)	Cool, may be badly stained
Grade, if No. 5 specs not met	*Soybeans, Sample Canada (colour) Account Light Weight*	

Note: The colour is added to the grade name.

Soybeans, Canada Yellow, Green, Brown, Black or Mixed (CAN), continued

Grade name	Damage		Downy mildew %	Other colours or bicoloured other than for mixed soybeans %	Foreign material					Splits %
	Heat-damaged or moldy %	Total %			Ergot %	Excreta %	Stones %	Foreign material other than grain %	Total %	
No. 1 Canada	Nil	2.0	2	2	0.01	0.01	Nil	0.1	1.0	10
No. 2 Canada	0.2	3	10	3	**0.025**	0.01	0.03	0.3	2	15
No. 3 Canada	1.0	5	No limit	5	0.1	0.01	0.1	0.5	3	20
No. 4 Canada	3	8	No limit	10	**0.25**	0.01	0.1	2	5	30
No. 5 Canada	5	15	No limit	15	**0.25**	0.01	0.1	3	8	40
Grade, if No. 5 specs not met	*Soybeans, Sample Canada (colour) Account Heated or Mouldy*	*Soybeans, Sample Canada (colour) Account Damaged*		Appropriate mixed grade	*Soybeans, Sample Canada (colour) Account Ergot*	*Soybeans, Sample Canada (colour) Account Excreta*	2.5% or less—*Soybeans, Rejected (grade) Account Stones*, or *Soybeans, Sample Canada (colour) Account Stones* Over 2.5%—*Soybeans, Sample Salvage*	*Soybeans, Sample Canada (colour) Account Admixture*	*Soybeans, Sample Canada (colour) Account Admixture*	*Soybeans, Sample Canada (colour) Account Splits*

Note: The colour is added to the grade name.

Export shipments

Shipments can be commercially clean or not commercially clean.

Commercially clean

No dockage is assessed on commercially clean shipments.

Samples are considered commercially clean when the sample contains 0.2% or less by weight of pods, stems, or coarse vegetable matter, including 0.1% or less of material other than whole or broken soybeans that passes through the No. 8 round-hole sieve.

In addition, in samples of commercially clean shipments, the amount of finely broken soybeans that passes through a No. 8 round-hole sieve

- On shipments not for direct export, can be up to 0.75% by weight
- On shipments for direct export, can be up to 1.0% by weight

Definition of commercially clean specifications for soybeans

Grade name	1	2	*3 (1+2)	4	5
	Material other than broken soybeans through the #8 round hole sieve.	Roughage and Hulls	Total roughage, hulls and material other than broken soybeans through the #8 round hole sieve.	Broken Soybeans through the #8 round hole sieve	
				Not direct exports	Direct exports
Soybeans 1,2,3,4,5 Canada	0.1%	0.2%	0.2%	0.75%	1.0%

Not commercially clean (NCC)

Shipments which, do not meet the definition of commercially clean, are considered not commercially clean and are allowed only with the permission of the CGC. Dockage is reported to the nearest

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

less a deduction of up to 0.2% to take into account the buildup of attritional material and hulls for direct shipments only.

Grading

Soybeans on export are graded in accordance with primary grade standards and specifications.

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Determination of dockage

Definitions

Dockage is not assessed on fababean samples that meet the commercially clean specifications set out in the Fababean Export Shipments section. All samples must be analyzed to determine if they meet commercial cleanliness standards prior to dockage being assessed. The analysis of samples which are **clearly** not commercially clean may consist of a visual assessment. For example, if there is no doubt that a sample contains more than 0.2% of foreign material then dockage will be assessed using the procedures defined under *Determination of Dockage*. Where there is any doubt regarding whether the sample is commercially clean the sample must be analyzed.

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain, that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the **gross weight** of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples graded

- *Fababeans, Sample Canada Account Fireburnt*
- *Fababeans, Sample Salvage*
- *Fababeans, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples shall be at least 1 kg.
   - Unofficial samples shall be at least 1 kg.
2. Choose the appropriate hand sieve for the size of fababean.

   No. 8 slotted
   No. 9 slotted
   No. 11 slotted
3. Sieve the samples over the appropriate slotted sieve, using approximately 250 g at a time, to remove all readily removable material.
4. Determine dockage, using the list under *Composition of dockage*.

Composition of dockage

- Material handpicked from the sieved sample, including all coarse vegetable matter such as pods, stems, straw, and thistle tops
- All material removed by sieving

▲ **Important:** Do not handpick mineral matter, ergot, sclerotinia, or large-seeded grains other than fababeans from the sieved sample.

- Soft earth pellets, if they are 10.0% or less of the uncleaned sample by weight

Commercially clean

Commercially clean primary samples can have up to 0.75% for finely broken fababeans removed by the No. 8 slotted sieve as dockage is allowed. Primary samples are considered commercially clean when meeting the requirements set out in the table below:

Definition of commercial cleanliness, Fababeans

	Foreign material	
Grade name	Material passing through No. 8 slotted sieve, including handpicked material %	Total %
No. 1 Canada	0.1	0.2
No. 2 Canada	0.1	0.2
No. 3 Canada	0.1	0.2

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of fababeans.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

Example
95.0% Fababeans, No. 1 CAN
4.0% Domestic Mustard Seed, No. 1 CAN Oriental
1.0% dockage

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is referred to as the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain.

Representative portions for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of fababeans for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Damage	100	250
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Foreign material	100	working sample
Heated or rotted	250	working sample
Insect parts	working sample	working sample
Mouldy	250	working sample
Odour	working sample	working sample
Perforated	100	250
Sclerotinia sclerotiorum	500	working sample
Splits	100	500
Stones	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Blackened

Fababeans are blackened when their seed coats are very dark blue to black.
See *Damage*.

Colour (CLR)

Colour is evaluated on the cleaned sample after the removal of damaged and split fababeans.

Terms used to describe colour in the grade determinants tables

Term	Characteristics
Reasonably good natural colour	Fababeans are moderately immature, with lightly adhered soil, moderately discoloured from storage or other natural causes, such as mottling.
Fair colour	Fababeans are immature but not green, have moderate amounts of adhered soil, or are otherwise moderately discoloured from natural causes, such as mottling.
Poor colour	Fababeans have a dark discolouration covering less than half of the hull, where there is no penetration of the cotyledon.

Other terms used to describe colour

Term	Characteristics
Sunburned or oxidation	Fababeans have undergone normal discolouration of the seed coats during storage. The colour varies from light tan to brown to very dark brown, depending on the duration and conditions of storage.
Immature	Fababeans are normal size and greenish, but not distinctly green.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the "*Canada Grain Act*" as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Fababeans, Sample Condemned*.

Cracked (CRKD)

Fababeans with a discoloured exposed cotyledon are considered cracked.
See *Damage*.

Cracked seed coats (CSDC)

Fababeans with cracked seed coats are considered sound if the halves of the kernels are held firmly together and the beans are not otherwise damaged.
See *Damage*

Damage (DMG)

Damage includes

- Blackened or cracked
- Sprouting
- Distinct immaturity
- Distinct deterioration or discolouration by weather or disease
- Insect damage
- Heat or mould damage
- Any other damage that seriously affects appearance or quality

Discoloured (DCLR)

Fababeans are considered discoloured if the discolouration on the seed coat covers more than half the bean or when the discolouration penetrates the cotyledon. See *Damage*.

Procedures

If the penetration of the discolouration is not obvious, cut the cotyledon crosswise in the discoloured area to determine the extent of the discolouration.

Earth pellets

- Hard earth pellets are pellets that do not crumble under light pressure.
  See *Stones*.
- Soft earth pellets are pellets that crumble under light pressure.
  See *Soft earth pellets*.

Ergot (ERG)

Ergot is a plant disease producing elongated fungus bodies with a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction *"Suspect Contaminated Grain, Handling Procedures"* for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Fababeans, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt fababeans are beans charred or scorched by fire. A cross-section of a fireburnt bean resembles charcoal with numerous air holes. The air holes result in a low weight bean which crumbles easily under pressure.

Procedures

Samples containing any fireburnt seeds are graded *Fababeans, Sample Canada Account Fireburnt.*

Foreign material (FM)

Foreign material is any material other than whole or split fababeans.

Green (GR)

Fababeans are considered green if they show distinctly green colour throughout the seed when cut to expose the cotyledons.
See *Damage.*

Heated (HTD)

Fababeans are considered heated or rotted if they are materially discoloured as a result of heating or rotting. Seed coats appear dark brown to black. The cotyledon tissue of dissected beans appears tan or brown. See *Damage.*

Heated seeds of other grains are included in the tolerance for *Heated.*

Insect parts (I PARTS)

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

Mouldy (MLDY)

Fababeans are considered mouldy if they show clear evidence of mildew or mould.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	Then the grade is . . .
An exessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Fababeans, Sample CW/CE Account Odour*
An exessive heated odour	*Fababeans, Sample CW/CE Account Heated*
An exessive fireburnt odour	*Fababeans, Sample CW/CE Account Fireburnt*

Perforated (PERF)

Fababeans are considered perforated if they show clear evidence of hull perforations caused by insects or disease.

Rime

White rime is the adhered lining of the seed pod.

- Fababeans that are completely and densely covered with white rime are considered damaged. See *Damage*.
- When the rime is sparse enough to expose the soundness of the bean, the bean is sound and the rime is considered in the general appearance of the sample.

Rotted (ROT)

See *Heated*.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Soft earth pellets (SEP)

Soft earth pellets are pellets that crumble under light pressure—if they do not crumble, they are considered stones. These pellets can be

- Earth and fertilizer pellets
- Any non-toxic material of similar consistency

Procedures

- Earth pellets may be removed as dockage. See *Normal cleaning procedures*.
- If soft earth pellets are over 10.0% of the gross weight of the sample, they become a grading factor, included in the tolerance for *Foreign Material*.

1. Return the pellets to the sample.
2. Handpick soft earth pellets from a representative portion of the cleaned sample.
3. If soft earth pellets are the grade determinant, grade the sample *Fababeans, Sample Canada Account Admixture*.

Splits (SPLTS)

Splits include

- Halves or smaller pieces of fababeans
- Halves that are loosely held together by cracked seed coats
- Fababeans with cracked cotyledons, such as from artificial drying

Splits do not include fababeans that are otherwise damaged.

Sprouted (SPTD)

Fababeans in which the hull is parted over the area of the germ as a result of sprouting are considered damaged. See *Damage*.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Representative portion for analysis

Minimum—250 g	Optimum—500 g	Export—1000 g

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Fababeans, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In eastern Canada samples of grain containing stones in excess of grade tolerances are degraded to lower grades. Samples containing stones in excess of the tolerance of the lowest grade established by regulation up to 2.5% are graded *Fababeans, Sample Canada Account Stones.*
- In western and eastern Canada grain containing more than 2.5% stones is graded *Fababeans, Sample Salvage.*

Examples: Western Canada

Excerpt from grade determinant tables for
Fababeans, Canada

Grade name	Stones %
No. 1 Canada	0.1
No. 2 Canada	0.2
No. 3 Canada	0.5

Basic grade:......................... *Fababeans, No. 2 Canada*
Reason for basic grade:....... 2.0% Damage

If the above sample contained	Grade in western Canada
0.4% stones	*Fababeans, Rejected No. 2 Canada Account Stones*
1.0% stones	*Fababeans, Rejected No. 2 Canada Account Stones*
3.0% stones	*Fababeans, Sample Salvage*

Examples: Eastern Canada

Excerpt from grade determinant tables for
Fababeans, Canada

Grade name	Stones %
No. 1 Canada	0.1
No. 2 Canada	0.2
No. 3 Canada	0.5

Basic grade:......................... *Fababeans, No. 2 Canada*
Reason for basic grade:....... 2.0% Damage

If the above sample contained	Grade in eastern Canada
0.4% stones	*Fababeans, No. 3 Canada*
1.0% stones	*Fababeans, Sample Canada Account Stones*
3.0% stones	*Fababeans, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Fababeans, Held IP Suspect Contaminated Grain.*

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Varieties

Fababeans are graded without reference to variety.

Primary and export grade determinants tables

Fababeans, Canada (CAN)

	Standard of quality		Damage				Foreign material					
Grade name	**Degree of soundness**	**Splits %**	**Heated or rotted %**	**Mouldy %**	**Perforated damage %**	**Total %**	**Ergot %**	**Excreta %**	**Insect parts %**	**Sclerotinia %**	**Stones or shale %**	**Total %**
No. 1 Canada	Reasonably well matured, reasonably good natural colour	6	Nil	Nil	1	4	0.05	0.01	0.02	0.05	0.1	0.2
No. 2 Canada	Fairly well matured, fair colour	9	0.3	0.6	3	6	0.05	0.01	0.02	0.05	0.2	0.5
No. 3 Canada	Cool and sweet, excluded from higher grades on account of immaturity, poor colour or damage	12	1	2	3	10	0.05	0.01	0.02	0.05	0.5	2
Grade, if No. 3 specs not met		*Fababeans, Sample Canada Account Splits*	*Fababeans, Sample Canada Account Heated*	*Fababeans, Sample Canada Account Mouldy Kernels*	*Fababeans, Sample Canada Account Damaged*	*Fababeans, Sample Canada Account Damaged*	*Fababeans Sample Canada Account Ergot*	*Fababeans, Sample Canada Account Excreta*	*Fababeans, Sample Canada Account Admixture*	*Fababeans, Sample Canada Account Admixture*	2.5% or less—*Fababeans, Rejected (grade) Account Stones*, or *Fababeans, Sample Canada Account Stones* Over 2.5%—*Fababeans, Sample Salvage*	*Fababeans, Sample Canada Account Admixture*

Export shipments

Shipments can be commercially clean or not commercially clean.

Commercially clean

Dockage is not reported for commercially clean shipments. A deduction for finely broken fababeans removed by the No. 8 slotted sieve as dockage is allowed

- On shipments not for direct export, of up to 0.75%
- On shipments for direct export, of up to 1.0%

Definition of commercial cleanliness, Fababeans

	Foreign material	
Grade name	Material passing through No. 8 slotted sieve, including handpicked material %	Total %
No. 1 Canada	0.1	0.2
No. 2 Canada	0.1	0.2
No. 3 Canada	0.1	0.2

Not commercially clean (NCC)

Shipments that do not meet the standards for commercial cleanliness are referred to as not commercially clean. Such shipments are permitted only with the permission of the CGC.

For samples representing not commercially clean shipments approved by the CGC for shipment from terminal elevators, dockage is reported to the nearest

- 0.1% for samples representing shipments loaded from a single terminal elevator
- 0.01% for composite samples representing shipments loaded from more than one terminal elevator

less a direct deduction of up to 0.2% to take into account the buildup of attritional material for direct shipments only.

Grading

Where no export standards exist, fababeans on export are graded in accordance with primary grade standards.

22. Chickpeas

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Classes, types and varieties

Classes

There are two classes of chickpeas, Kabuli and Desi.

- Kabuli chickpeas are typically whitish to light tan in colour however there are new varieties that are black or green in color.
- Desi chickpeas are typically brown in colour and smaller than Kabuli.

The class of chickpea forms part of the grade name; for example,
Chickpea, No. 1 CW Kabuli.
The method of determining the class of a chickpea is by the size and colour of the chickpea.

Determination of dockage

Definitions

Dockage is assessed and recorded to the nearest 0.1%.

Dockage is defined under the Canada Grain Act as "any material intermixed with a parcel of grain, other than kernels of grain of a standard of quality fixed by or under this Act for a grade of that grain that must and can be separated from the parcel of grain before that grade can be assigned to the grain." Dockage is removed by following the cleaning procedures described in this section of the guide.

The sample as it arrives is referred to as the uncleaned or dirty sample. Its weight is the gross weight of the sample. Dockage is assessed on the gross weight of the sample.

Dockage not reported

▲ **Important:** Dockage is not reported for samples grading

- *Chickpeas, Sample CW (class) Account Fireburnt*
- *Chickpeas, Sample Salvage*
- *Chickpeas, Sample Condemned*

Normal cleaning procedures

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances.

Dockage is assessed only on unprocessed samples of chick peas. All foreign material in processed samples is assessed as grading factors.

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
    - Official samples shall be at least 1 kg.
    - Unofficial samples shall be at least 1 kg.
2. Choose the hand sieve for the class of chick peas that will achieve maximum removal of dockage material with minimum loss of chick peas:
    - **Kabuli:** No. 18 round-hole sieve (large seeded)
      No. 12 slotted sieve (medium seeded)
    - **Desi:** No. 12 slotted sieve
3. Sieve the sample, using approximately 250 grams at a time, over the appropriate sieve to remove all readily removable material.
4. Handpick the portion remaining on top of the sieve to remove all coarse vegetable matter such as pods, stems, straw, thistle tops.

Composition of dockage

All material removed by sieving or handpicking or both, as defined in *Normal cleaning procedures.*

Optional analysis

Where a shipper requests special cleaning of a carlot of grain at a terminal elevator, and the elevator manager agrees, dockage material will be analyzed for the presence of grain. The percentage and grade of any grain contained in the dockage will be reported.

Procedures

1. Analyze the official sample.
2. Record the following on inspection records:
   - The percentage by gross weight to the nearest 0.1% and the grade of chick peas.
   - The percentage by gross weight to the nearest 0.1% and the grade of grain separable from dockage.
   - The percentage of dockage.

   Example
   95.0% Chickpeas, No. 1 CW Desi
   4.0% Domestic Mustard Seed, No. 1 CAN Oriental
   1.0% dockage

Sizing

Upon written request, samples of chickpeas may be analyzed for size. Sizing procedures are as follows:

Procedures

1. Using a Boerner-type divider, divide the clean sample to obtain a representative portion of between 250 – 300 grams.
2. Pour the representative sample onto the left hand side of the hand sieve.
3. Move the sieve from left to right 20 times, using a sifting motion. One time is one complete motion from center, to one side, to the other side and back to the center. The total distance from left to right is 20 cm or about 8 inches.
4. Determine the amount remaining on top of the sieve. Passing your hand along the underside of the sieve may be necessary in order to dislodge all the seeds.
5. Report the percent by weight of the seeds remaining on top of the sieve.

   Note: The size of sieve must be clearly indicated on the written request. Generally, sizing would be done using one of the following hand sieves – No. 8, 9 or 10 mm round hole, however, the analysis can be done on any sieve size as requested.

Grading

Important definitions

Net weight of sample

The sample after cleaning and removal of dockage is called the cleaned sample. Its weight is the net weight of the sample. Percentages by weight for grading refer to percentages of the cleaned sample, or the net weight.

Hazardous substances in samples

Wear gloves and a mask to handle any samples that you suspect may contain hazardous substances. Hazardous substances are defined in the Regulations as "any pesticide, herbicide, desiccant or inoculant."

Non-Registered Varieties

Where grain of any kind is not a registered variety under the Seeds Act, no person shall, except with the permission of the Canadian Grain Commission, assign a statutory grade to that grain which is higher than the lowest grade established by regulation for that kind of grain. An order is issued annually to allow non-registered varieties of Chickpeas to be graded higher than the lowest statutory grade.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Representative portion of chickpeas for grading, grams

Grading factor	Sample portion size range	
	Minimum	Maximum
Colour	working sample	working sample
Damage	100	250
Excreta	working sample	working sample
Fertilizer pellets	working sample	working sample
Fireburnt	working sample	working sample
Foreign material	100	working sample
Green	100	250
Insect parts	working sample	working sample
Mechanical damage including splits	100	250
Odour	working sample	working sample
Treated seed	working sample	working sample

Grading factors

Colour (CLR)

Colour is a grade determinant only in the Kabuli class. Colour is assessed after the removal of damaged chick peas and chick peas assessed as green. See *Damaged* and *Green*.

If chickpeas are . . .	**Colour is . . .**
Sound, well matured and have a uniform normal colour	Good
Immature, but not green, have moderate amounts of adhered soil, are lightly stained but otherwise moderately discoloured from natural causes	Fair
Do not meet the definition of fair colour	Poor

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Chickpeas, Sample Condemned*.

Damage (DMG)

Damaged chickpeas include

- Whole or broken chick peas that are sprouted, frost damaged, heated, damaged by insects, distinctly deteriorated or discoloured by weather or by disease, or that are otherwise damaged in a way that seriously affects their quality.

In Kabuli chickpeas, white and shriveled chick peas and yellow or water stained chickpeas should be cut and examined for damage. If the cotyledons show

- Any signs of visible damage, they are considered damaged
- No signs of visible damage, they are considered in the evaluation of colour

Earth pellets (EP)

See *Foreign material*.

Ergot (ERG)

See *Foreign material*.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples *that you suspect may* contain excreta.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction *"Suspect Contaminated Grain, Handling Procedures"* for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Chickpeas, Held IP Suspect Contaminated Grain.*

Fireburnt (FBNT)

Fireburnt seeds have been charred or scorched by fire. No fireburnt seeds are allowed in chickpeas.

Procedure

Samples considered fireburnt are graded *Chickpeas, Sample CW (class) Account Fireburnt.*

Foreign material (FM)

Foreign material includes

- Other classes of chick peas
- Other grains and seeds
- Ergot and Sclerotinia
- Mineral matter, stones and earth pellets
- Any other material not removed by *Normal cleaning procedures*

Green (GR)

Chickpeas may be considered green regardless of the cause. (Does not apply to green coloured varieties)

Frost-damaged chickpeas which are green are considered under the grade determinant for *Green*.

Frost-damaged chickpeas with no green colour are considered under the grade determinant for *Damage*.

Kabuli chickpeas are considered green if they show any green colour of any size area anywhere on the seeds or seed coats.

Desi chickpeas are considered green if they show distinctly green colour throughout the seed when cut to expose the cotyledons.

Heated (HTD)

Chickpeas that have dull seed coats and discoloured cotyledons ranging from light tan to dark brown are considered heated. See *Damage*.

Heated seeds of other grains are included in the tolerance for *Damage*.

Insect damage (I DMG)

See *Damage*.

Insect parts (I PARTS)

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

Mechanical damage including splits (MDMGINCSPLTS)

In chickpeas, mechanical damage including splits includes

- Whole chickpeas with more than 10% of the chickpea broken off
- Split chickpeas

▲ **Important:** Seeds with hairline cracks and chipped seed coats are not considered mechanical damage.

Procedures

Chickpeas with mechanical damage are hand-picked from the cleaned sample.

Odour (ODOR)

There is no numeric tolerance for odour. Consider

- The basic quality of the sample
- The type and degree of the odour
- The presence of visible residue causing the odour

If odour is the grade determinant and there is . . .	**Then the grade is . . .**
A distinct objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Chickpeas, Sample CW (class) Account Odour*
A distinct heated odour	*Chickpeas, Sample CW (class) Account Heated*
A distinct fireburnt odour	*Chickpeas, Sample CW (class) Account Fireburnt*

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior. See *Foreign material*

Soft earth pellets (SEP)

See *Foreign material.*

Stones (STNS)

See *Foreign material.*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals–pink or red, canola–baby blue or green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Chickpeas, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary and export grade determinants tables

Chickpeas, Canada Western Kabuli (CW)

Grade name	Standard of quality	Damage %	Mechanical damage including splits %	Green %	Foreign material			
	Colour				Ergot %	Excreta %	Insect parts %	Total %
No. 1 CW	Good, natural colour	0.5	1	0.5	0.05	0.01	0.02	0.10
No. 2 CW	Fair	1	2	1.0	0.05	0.01	0.02	0.2
No. 3 CW	Poor	2	3	2	0.05	0.01	0.02	0.2
Grade, if No. 3 specs not met	*Chickpeas, Sample CW Kabuli Account Colour*	*Chickpeas, Sample CW Kabuli Account Damaged*	*Chickpeas, Sample CW Kabuli Account Mechanical Damage including Splits*	*Chickpeas, Sample CW Kabuli Account Green*	*Chickpeas, Sample CW Kabuli Account Ergot*	*Chickpeas, Sample CW Kabuli Account Excreta*	*Chickpeas, Sample CW Kabuli Account Foreign Material*	*Chickpeas, Sample CW Kabuli Account Foreign Material*

Canada Western Desi (CW)

Grade name	Damage %	Mechanical damage including splits %	Green %	Foreign material			
				Ergot %	Excreta %	Insect parts %	Total %
No. 1 CW	1	2	1.0	0.05	0.01	0.02	0.10
No. 2 CW	2	3.5	2.0	0.05	0.01	0.02	0.2
No. 3 CW	3	5	3	0.05	0.01	0.02	0.2
Grade, if No. 3 specs not met	*Chickpeas, Sample CW Desi Account Damaged*	*Chickpeas, Sample CW Desi Account Mechanical Damage including Splits*	*Chickpeas, Sample CW Desi Account Green*	*Chickpeas, Sample CW Desi Account Ergot*	*Chickpeas, Sample CW Desi Account Excreta*	*Chickpeas, Sample CW Desi Account Foreign Material*	*Chickpeas, Sample CW Desi Account Foreign Material*

Export shipments

Chickpeas on export are graded in accordance with primary grade standards and specifications. Foreign material in cleaned or processed chickpeas is treated as a grading factor and not assessed as dockage. Cargoes containing dockage may not be shipped except with permission from the CGC.

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Composition of screenings

Screenings consist of dockage material that qualifies only for Class IV grades. Screenings are graded in accordance with the specifications in the *Off-grades of Grain and Grades of Screenings* order.

Show the composition of screenings in detail on all records for carlots and cargoes. The composition determines the market value of the screenings.

Whole grain in screenings

Whole grain in screenings includes wheat, rye, barley, oats, triticale, flaxseed, rapeseed, canola, domestic mustard seed and pulses.

At a terminal or process elevator, show the percentage by weight and the grade of whole grain in screenings on all inspection records and grade certificates and as part of the grade name, if

- Shipments contain 6.0% or over by weight of whole grain which can be separated by the usual cleaning methods
- The grain qualifies for an official, special or off-grade

For example,

Grade: *Refuse Screenings, less 15.0% Wheat, CW/CE Feed*	
Composition	10.0% chaff
	15.0% Wheat CW/CE Feed
	8.0% large seeds
	67.0% small seeds and dust
Total	**100.0%**

Report the percentage by weight and the kinds of whole grain in the sample for samples representing shipments from primary elevators or unlicensed warehouses to destinations other than terminal elevators.

For example,

Grade: *Refuse Screenings, less 15.0% Wheat*	
Composition	10.0% chaff
	15.0% Wheat
	8.0% large seeds
	67.0% small seeds and dust
Total	**100.0%**

Canola, rapeseed or domestic mustard seed in screenings

Record the percentage by weight of whole seeds of small oilseeds, canola, rapeseed or domestic mustard seed, that can be separated from samples of screenings by approved sieves.

Include small, shrivelled or broken seeds which pass through the slotted sieve in the total percentage by weight of small seeds and dust.

Dockage

Dockage is not assessed for screenings except for *Mixed Feed Oats*.

Grading factors

Ergot (ERG)

Ergot is a disease that attacks cereal grains and results in a fungus growth in place of the kernel of grain. The disease produces elongated fungal bodies that have a purplish-black exterior, a purplish-white to off white interior, and a relatively smooth surface texture.

Excreta (EXCR)

Excrement from any animal including mammals, birds and insects.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain excreta.

Heated, fireburnt and odour (HTD, FBNT, ODOR)

Screenings that are not sweet are graded according to their composition with the condition included in the grade name.

If odour is the grade determinant and there is . . .	Then the grade is . . .
An excessive objectionable odour not associated with the quality of the grain, but not heated or fireburnt	*Screenings, (Grade Name) Account Odour*
An excessive heated odour	*Screenings, (Grade Name) Account Heated*
An excessive fireburnt odour	*Screenings, (Grade Name) Account Fireburnt*

Injurious seeds

The following seeds are designated by the Feeds Regulations as detrimental to animal health:

bird rape
cockle, purple
false flax, flat-seeded
false flax, western (large seeded)
mustard, Indian
mustard, tumble
mustard, wormseed
cockle, cow
darnel
false flax, small-seeded
mustard, black
mustard, hare's-ear
mustard, wild
stinkweed

Knuckles and straw, (KNKLS&STRAW)

Knuckles include empty wheat heads, nodes of stems and short pieces of straw up to approximately 2.5 cm in length.

Mustard seed (MUS)

Common wild mustard and hare's ear mustard seed are designated as injurious in the Canada Feed Regulations.

Other domestic grains

Other domestic grains are any grains other than wheat, rye, barley, oats, triticale, flaxseed, solin, rapeseed, canola, domestic mustard seed and pulses.

Other large seeds (OLSDS)

Other large seeds are seeds not designated as injurious in the Canada Feed Regulations. They include lady's thumb and pale smartweed.

Sclerotinia sclerotiorum (SCL)

Sclerotinia sclerotiorum is a fungus producing hard masses of fungal tissue, called *sclerotia*. The sclerotia vary in size and shape, have a course surface texture, vary in exterior color from dark black to gray to white and have a pure white interior.

Soft earth pellets (SEP)

Soft earth pellets include soft fertilizer pellets and any other non-toxic material of a similar consistency.

Stones (STNS)

Stones include hard shale, coal, hard earth pellets, fertilizer pellets and other non-toxic materials of similar consistency.

Other factors

By-products of a manufacturing process

By-products of a manufacturing process are materials such as malt sprouts, oat hulls, ground and pelleted material. They do not qualify as grain screenings.

If inspection is requested on material that is wholly or partly processed grain screenings, it is graded *Sample* according to the dominant product, for example, *Sample Malt Sprouts, Sample Screenings, Ground; Sample Oat Hulls*.

Pelleted screenings

When official weighing or inspection of pellets made from Canadian grain screenings is requested, the official description is *Canadian ground and pelleted screenings*.

At the request of a shipper, you may show the prime source of screenings in parentheses following the description, for example, *Canadian ground and pelleted screenings (flaxseed)*.

If you are in doubt about the source, you may request a letter of certification from the shipper certifying the source of the screenings. Shippers may also request to have the word *grain* included in the description of the pellets, for example, *Canadian ground and pelleted grain screenings*.

Pellets received into terminal elevators made from processing residues of agricultural products are described as simply as possible, for example, *Canadian canola extraction pellets, Canadian wheat bran pellets, Canadian beet pulp pellets.* You must be reasonably certain of the source or country of origin.

Cleaning screenings

Feed screenings

1. Divide a representative portion of approximately 500 g from the sample.
2. Sift the portion over the No. 4.5 round-hole sieve to assess the percentage of small weed seeds, chaff, hulls, dust, etc.
3. Handpick a representative portion of at least 10 g to determine the components of the sample.
4. Show the composition in detail in all records and endorse the backs of certificates.

Uncleaned screenings

Uncleaned screenings do not meet the specifications for No. 1 or No. 2 Feed screenings because of their content of weed seeds, hulls, chaff or dust. Uncleaned screenings must contain at least 35.0% of material that if separated would meet the grade requirements for No. 1 Feed screenings.

1. Divide a representative portion of not less than 750 g from the uncleaned sample.
2. Sift the portion over the No. 4.5 round-hole sieve to assess the percentage by weight of small weed seeds and dust.
3. Handpick a representative portion not less than 10 g to determine the components of the sample.
4. Show the composition of the sample in detail on all records and endorse the backs of certificates.

Refuse screenings

Refuse screenings do not meet the grade requirements for *Uncleaned screenings* because of their content of weed seeds, chaff or dust.

1. Divide a representative portion of not less than 250 g from the uncleaned sample.
2. Sift the representative portion over the No. 5 buckwheat and the No. 4.5 round-hole sieves nested to determine the percentage by weight of seeds.
3. Class as large seeds those that pass through the No. 5 buckwheat sieve but remain on top of the No. 4.5 round-hole.
4. Class as small seeds material that passes through the No. 4.5 round-hole sieve.
5. Handpick a representative portion of at least 25 g of the material remaining on top of the 5 buckwheat sieve.

Notation as to kind

When no written request is received for a notation as to kind, such a notation is entered on the records only and it is stated that the notation does not appear on the certificate, for example, *Canola – not shown on certificate*

Grade determinants tables

Screenings

			Maximum tolerances, including canola, rapeseed, wild and domestic mustard seed						
				Maximum tolerances, including weed seeds which pass through a No. 4.5 round-hole sieve, chaff, dust					
						Knuckles and straw			
Grade name	Standard of quality	Minimum quantity of shrunken or broken grain %	Hare's ear or wild mustard seed %	Hulls %	Soft earth pellets %	Straw %	Total %	Total %	Total %
No. 1 Feed Screenings	Must be cool and sweet	35	2	1	1	0.25	3	3	6
No. 2 Feed Screenings	Must be cool and sweet	No minimum	2	1	1	0.25	3	3	10
Uncleaned	No requirements	*	*	*	3	5	5	*	*
Refuse	No requirements	No minimum	No limit	No limit	3	No limit	No limit	No limit	No limit
Grade, if specs not met	*(Grade name)*, Account Heated, or Fireburnt, or Odour*				*Sample Screenings, Account Soft Earth Pellets*				

			Injurious seeds								
Grade name	Ergot %	Excreta %	Other than hare's ear or wild mustard seed %	Total %	Other domestic grains %	Other large seeds %	Sclerotinia %	Stones %	Wild buckwheat %	Wild oats %	Wild oat hulls %
No. 1 Feed Screenings	0.1	0.02	1	2	Nil	10	0.25	0.3	65	8	N/a
No. 2 Feed Screenings	0.1	0.02	1	2	5	No limit	0.25	0.3	No limit	49	N/a
Uncleaned	0.1	0.1	*	*	10	*	0.25	0.5	*	49	1
Refuse	0.1	0.1	No limit	No limit	10	No limit	0.25	0.5	No limit	No limit	No limit
Grade, if specs not met	*(Grade name) Screenings, Ergoty*	*Sample Screenings, Account Excreta*			*Sample Screenings, with composition in remarks*		*Sample Screenings, Account Sclerotinia*	*Sample Screenings, Account Stones*		See *Mixed feed oats*	

* Sample must contain 35% of material that qualifies for No. 1 Feed Screenings

Mixed Feed Oats

Cleaning

1. Divide a representative portion of at least 750 g from the uncleaned sample.
2. Sift the representative portion over the No. 4.5 round-hole sieve to remove up to 1% by weight of small weed seeds, chaff and dust.

   If more than 1% of small seeds, chaff and dust passes through the No. 4.5 round hole sieve,
   1. Assess dockage.
   2. Record dockage to the nearest 0.1%.
3. Handpick soft earth pellets from the cleaned sample.
   - For samples containing up to 10% by weight of soft earth pellets, assess earth pellets as dockage.
   - For samples containing over 10% soft earth pellets by weight, grade *Sample Screenings, Account Earth Pellets*.
4. Show the composition in detail on all records for carlots and cargoes.

Composition

Samples must contain at least 50% by weight of wild oats.

Grade name	Material through No. 4.5 round-hole sieve %	Wild buckwheat, wheat heads, knuckles, straw and chaff			
		Knuckles, straw and chaff %	Wheat heads %	Wild buckwheat %	Total %
Mixed Feed Oats	1	4	5	5	5
No. 2 Mixed Feed Oats	1	4	5	5	10
Grade, if No. 2 specs not met	Report as dockage to the nearest 0.5%				

Grade name	Ergot %	Excreta %	Flaxseed %	Heated %	Other domestic grains %	Sclerotinia %	Stones %
Mixed Feed Oats	0.25	0.02	5	5	5	0.25	0.1
No. 2 Mixed Feed Oats	0.33	0.02	5	10	5	0.25	0.2
Grade, if No. 2 specs not met	*Mixed Feed Oats, Ergoty*	*Mixed Feed Oats, Excreta*		*Mixed Feed Oats, Heated*		*Sample Screenings Account Sclerotinia*	*Sample Screenings Account Stones*

24. Experimental grades of wheat

Criteria for designation as experimental grades **24-2**

Wheat **24-3**
- Classes and varieties 24-3
- Cleaning 24-3
    - Representative portion for grading 24-3
    - Contaminated grain 24-4
    - Degermed 24-4
    - Fertilizer pellets (FERT PLTS) 24-4
    - Grass green 24-4
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    - Insect damage 24-5
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Primary grade determinants tables **24-7**
- Wheat, Canada Western Experimental (CW EXPRMTL) 24-7
- Wheat, Canada Western Experimental (CW EXPRMTL), continued 24-8

Criteria for designation as experimental grades

Experimental grades for selected varieties of wheat have been established to allow Canadian agricultural entities to market test varieties that do not readily fit into the existing grade structure, but which show some promise for acceptability in world markets.

A variety is eligible to be assigned to the grades defined in the experimental grade schedules only if the variety is designated by the Canadian Grain Commission.

The criteria for a variety to be eligible for designation are
- There is evidence that Canadian producers will derive a benefit from its production either immediately or in the future.
- There is supportive data for its agronomic characteristics and end-use quality.
- The variety will be produced under contract to the sponsoring organization.
- The variety will remain in the program for a specified period.

When a variety is no longer eligible for the experimental grades, the sponsoring organization purchases and disposes of all existing stocks to prevent adulteration of registered varieties unless the Canadian Grain Commission establishes a grade schedule for that variety and any other varieties of that grain having similar qualities.

Wheat

Classes and varieties

A variety from any class of wheat may be approved for eligibility for experimental grades. The class of wheat is noted in the remarks on inspection records.

Samples containing admixtures of registered Canadian or foreign varieties in excess of 5.0% by weight are graded *Canada Western Feed*.

Cleaning

- Dockage is assessed using the procedures described in Chapter 4 of this Guide.
- All special cleaning described in Chapter 4 is applied to experimental grades, provided that the grade can be improved.

Representative portion for grading

All grading is done on representative portions divided down from the clean sample, using a Boerner-type divider.

The terms "Minimum" and "Maximum" refer to the range of sample portion size to be analyzed when an objective factor is present. The *optimum representative portion* (see glossary) is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

See wheat chapter for *Representative portions, grams*

Grading factors

Samples eligible for experimental grades but displaying grading factors other than stones that are above established tolerances are graded *Canada Western Feed* or *Sample* depending on the severity of the grading factors.

Contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as: "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Samples deemed to be contaminated by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada are graded *Wheat, Sample Condemned.*

Degermed

Tolerances apply to kernels not classed as sprouted.

Fertilizer pellets (FERT PLTS)

Fertilizer pellets are a manufactured plant nutrient product used by producers in the production of grain. They are typically small, round or irregular shaped and usually white, grey, brown, pink or reddish in colour.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction *"Suspect Contaminated Grain, Handling Procedures"* for procedures to be followed when handling samples containing fertilizer pellets.

Procedures

- Handpick any fertilizer pellets and determine the concentration basis the net working sample.
- Fertilizer pellets are assessed as stones when the concentration does not exceed 1.0% of the net sample weight.
- Samples containing fertilizer pellets in excess of 1.0% of the net sample weight are graded *Wheat, Held IP Suspect Contaminated Grain.*

Grass green

Tolerances are only a guide. Consider the overall quality of the sample.

Hard vitreous kernels

Vitreousness is the natural translucent colouring that is a visible sign of kernel hardness. It is a factor for hard wheat varieties only. For a full description, see Chapter 4.

Insect damage

Consider the overall quality of the sample.

Stones (STNS)

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Procedures

1. Handpick stones from a representative portion of the cleaned sample.
2. Determine stone concentration in the net sample.

Note: Stones may be removed and included in dockage if the the material removed is 5.0% or less of the gross weight of the sample. See *Cleaning for grade improvement*.

- In western Canada samples of grain containing stones in excess of "basic grade" tolerances, up to 2.5% are graded *Wheat, Rejected "basic grade" Account Stones*. The "*basic grade*" refers to a grade established in the Canada Grain Regulations (grades listed in the first column in grade determinant tables) that would have been assigned to the sample if it contained no stones.
- In western and eastern Canada grain containing more than 2.5% stones is graded *Wheat, Sample Salvage*.

Examples: Western Canada

Excerpt from grade determinant tables for
Wheat, Canada Western Experimental

Grade name	Stones %
No. 1 CW EXPRMTL	0.03
No. 2 CW EXPRMTL	0.03
No. 3 CW EXPRMTL	0.06
CW Feed	0.10

Basic grade:......................... *Wheat, No. 3 Experimental*
Reason for basic grade:....... Mildew

If the above sample contained	Grade in Western Canada
0.08% stones	*Wheat, Rejected No. 3 CW Experimental Account Stones*
3.0% stones	*Wheat, Sample Salvage*

Treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments for cereals is pink or red and for canola is baby blue, white and green. Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

▲ **Important:** Wear gloves and a mask to handle any samples that you suspect may contain contaminated grain.

Procedures

If a sample is suspected of being coated with a pesticide, desiccant, inoculant or if the sample contains evidence of any foreign chemical substance other than fertilizer pellets, the sample shall be graded *Wheat, Held IP Suspect Contaminated Grain*.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing treated seed or other chemical substances.

Primary grade determinants tables

Wheat, Canada Western Experimental (CW EXPRMTL)

Grade name	Standard of quality				Foreign material					
	Minimum test weight kg/hl (g/0.5 L)	Variety	Degree of soundness	Minimum hard vitreous kernels %	Ergot %	Excreta %	Matter other than cereal grains %	Sclerotinia %	Stones %	Total %
No. 1 CW EXPRMTL	79 (385)	Any wheat variety of the class Canada Western Experimental designated as such by Order of the Commission	Reasonably well matured, reasonably free from damaged kernels	65	0.01	0.01	0.2	0.01	0.03	0.4
No. 2 CW EXPRMTL	77.5 (378)		Fairly well matured, may be moderately bleached or frost-damaged, reasonably free from severely damaged kernels	35	0.02	0.01	0.2	0.02	0.03	0.75
No. 3 CW EXPRMTL	76.5 (373)		May be frost-damaged, immature or weather-damaged, moderately free from severely damaged kernels	No minimum	0.04	0.015	0.2	0.04	0.06	1.25
CW Feed	65 (315)	Any class or variety of wheat excluding amber durum and any variety of the class CWSP	Reasonably sweet, excluded from other grades of wheat on account of damaged kernels	No minimum	0.1	0.03	1	0.1	0.1	10
Grade, if specs for CW Feed not met	*Wheat, Sample CW Account Light Weight*				*Wheat, Sample CW Account Ergot*	*Wheat, Sample CW Account Excreta*	*Wheat, Sample CW Account Admixture*	*Wheat, Sample CW Account Admixture*	2.5% or less– *Rejected (grade) Account Stones* Over 2.5%– *Wheat, Sample Salvage*	See *Mixed grain*

Wheat, Canada Western Experimental (CW EXPRMTL), continued

	Wheats of other classes or varieties									Heated	
Grade name	Contrasting classes %	Total %	Artificial stain, no residue %	Dark, immature %	Degermed %	Fireburnt %	Fusarium damage %	Grass green %	Grasshopper, army worm %	Binburnt, severely mildewed, rotted, mouldy %	Total %
No. 1 CW EXPRMTL	0.5	1.5	Nil	1	4	Nil	0.25	0.75	1	0.005	0.05
No. 2 CW EXPRMTL	1.5	3	0.05	2.5	7	Nil	1.0	2	3	0.020	0.4
No. 3 CW EXPRMTL	2.5	5	0.1	10	13	Nil	2	10	8	0.030	1.0
CW Feed	10%, either alone or in combination with each other, of amber durum and any variety of the class CWSP		2	No limit	No limit	2	5	No limit	No limit	2.5	2.5
Grade, if specs for CW Feed not met	Over 10% amber durum—*Wheat, Sample CW Account Admixture*		*Wheat, Sample CW Account Stained Kernels*			*Wheat, Sample CW Account Fireburnt*	Over 5%—*Wheat, Sample CW Account Fusarium Damage* Over 10%—*Wheat, Commercial Salvage*			*Wheat, Sample CW Account Heated*	

				Shrunken and broken			Smudge and blackpoint		Sprouted	
Grade name	Natural stain %	Pink %	Sawfly, midge %	Shrunken %	Broken %	Total %	Smudge %	Total %	Severely sprouted %	Total %
No. 1 CW EXPRMTL	0.5	1.5	2.0	4	5	7	0.30	10	0.1	0.5
No. 2 CW EXPRMTL	2	5	5	4	6	8	1	20	1.5	
No. 3 CW EXPRMTL	5	10	10	4	7	9	5	35	5	
CW Feed	No limit	No limit	No limit	4	13	15	No limit	No limit	No limit	
Grade, if specs for CW Feed not met					*Sample Broken Grain*					

25. Sample feed grain

Determination of dockage

Samples are graded using procedures for sample feed grain when they exceed the Broken tolerances for Mixed Grain.

▲ **Important:** When a sample is to be graded as sample feed grain,

1. Return dockage to the cleaned sample.
2. Begin cleaning and dockage assessment using the procedures described in this section.

Dockage is assessed to the nearest 0.1% on all samples.

Normal cleaning procedures

1. Using a Boerner-type divider, divide the uncleaned sample to obtain a representative portion.
   - Official samples should be at least 1000 grams.
   - Unofficial samples must be at least 1000 grams.
2. Sieve the sample over the No. 4.5 round-hole hand sieve, using approximately 250 g at a time.

Composition of dockage

Dockage contains

- Material that passes through the No. 4.5 round-hole sieve
- Material removed by special cleaning for grade improvement

Cleaning for grade improvement

If the grade of a sample can be improved by additional cleaning, perform the cleaning and add the additional material to dockage. Cleaning for grade improvement can be done at any time after the cleaning assessment has been completed.

1. After the cleaning assessment has been completed, use a No. 6 or a No. 5 buckwheat hand sieve to remove large seeds. Large seeds are removed if their total weight exceeds 3% of the cleaned sample by weight.
2. Record the additional cleaning and dockage on inspection records.

Primary and export grade determinants tables

Sample feed grain

	Foreign material												
					Large material								
Grade name	Ergot %	Excreta %	Flaxseed %	Fusarium %	Wheat heads %	Knuckles and straw %	Large weed seeds %	Total %	Sclerotinia %	Soft earth pellets %	Stones %	Wild oats %	Total large material and wild oats %
Sample feed grain	0.33	0.03	5	4	10	4	3	10	0.25	0.33	0.1	49	50
	Sample Feed Grain, Ergoty	*Sample (with components named)*	*Sample (with components named)*	*Sample (with components named)*	*Sample (with components named)*	*Sample (with components named)*	*Sample (with components named if not removable with approved sieves)*	*Sample (with components named)*	*Sample Feed Grain, Sclerotinia*	*Sample, Feed Grain, Soft Earth Pellets*	2.5% or less—*Sample Feed Grain, Stones* Over 2.5%—*Sample Feed Grain, Sample Salvage*	*Mixed Feed Oats*	*Sample (with components named)*

Large weed seeds includes other grains such as peas, corn, domestic buckwheat, etc.
Samples containing over 3.0% by weight are graded *Sample* and the components are named.
Soft earth pellets are included in total of large seeds.

	Damage		
Grade name	Broken grain %	Fireburnt %	Heated %
Sample feed grain	50	2	5
	Sample Broken Grain (class on request)	*Sample Feed Grain, Fireburnt*	*Sample Feed Grain, Heated*

26. Standard abbreviations

The following standard abbreviations are used in inspection reports, official records and in conjunction with the CGC's Industry Services *Online Shipping Certification & Recording* (OSCAR) and the *Submitted Official Sample* (SOS) computer programs.

A

account	AC
adhered hulls	ADHULLS
adhered soil	ADHS
admixture	ADMX
aflatoxin	AFL
all rail	A/R
alternate grade	ALT GRD
amber durum	AD
appears to be	ATB
approximately	APPROX
artificial stain	ART STND
aspiration	ASP
aspiration, roughage and broken	ASPRHGEBKN
attrition	ATT
azuki (adzuki)	AZU

B

barley	BLY
barley of other classes	BOOC
barley of other types	BOOT
beans	BEN
binburnt	BBT
binburnt, severely mildewed, rotted, mouldy	BBTSEVMILROTMLDY
black	BLK
black hilum	BHIL
black turtle	BKT
blackeye	BKE
blackpoint	BLK PT
bleached	BLCH
blue-eye mould	BEM
brake end	BE
bran pellets	BRAN PLTS
broken	BKN
broken after cleaning	BKNACL
broken and shrunken	BKN&SHR
broken deducted	BKN DED
broken grain	BKN GRN
broken left	BKN LEFT

broken or shrunken	BKN OR SHR
brown	BRN
brown hilum	BRNHIL
buckwheat	BWT

C

Canada	CAN
Canada Eastern	CE
Canada Prairie Spring	CAN PRIE SPG
Canada Prairie Spring Red	CPSR
Canada Prairie Spring White	CPSW
Canada Western	CW
Canada Western Red Spring	CWRS
Canada Western Red Winter	CWRW
canario	CNRO
canary seed	CNY SD
canola	CNL
canola and mustard	CNL & MUS
canola / mustard seed	CNL/MUS
canola meal	CNL MEAL
Century	CNTY
cereal grain	C GRN
chaff	CHF
chaff and dust	CHF & DUST
chick peas	CHKPEA
chlorophyll	CHLL
clean	CLN
clover	CLV
cockle	COC
cockle other classes	COC OCL
colour, colours	CLR
commercially clean	CCLN
composite	COMP
condemned	CNDM
confectionery	CONF
conspicuous admixture	CADMX
container	CONT
contaminated	CONTAM
contrasting classes	CON CL
contrasting colours	CON CLR
copper	COP
corn	CRN*
cow cockle	CCOC
cracked	CRKD
cracked corn	CC
cracked corn and foreign material	CCFM
cracked seed coat	CSDC
cracked seed coats including splits	CSDC&SPLTS
cranberry	CBY

D

damage	DMG
damaged	DMGD
damage, foreign material and contrasting classes	DMGFMCONCL
damp	DP
damp extra	DP EX
damp sample	DP SPLE
damp sample Canada	DP SPLE CAN
dark green speckled	DGS
dark immature	DKIM
dark hilum	DHIL
dark red kidney	DRK
Dashaway	DSHY
deducted	DED
degermed	DGM
dehulled	DHULL
dehulled seed	DHULL SD
dehydrated	DEH
destination	DEST
destroyed	DST
different	DIFF
different classes combined	DCC
different grades combined	DGC
discoloured	DCLR
distinctly detrimental	DDET
distinctly green	DGR
dockage	DKG
dockage excreta	DKG EXCR
domestic	DOM
domestic mustard seed	DMS
domestic seeds and green and tfm	DSDSGRNTFM
downy mildew	DWNY MIL
dutch brown	DBR

E

earth pellets	EP
eastern	E
elevator	ELEV
empty, clean and dry	ECD
ergot	ERG
ergoty	ERGY
excreta	EXCR
experimental	EXPRMTL
export ready	ER
extra	EX
extra strong	ES

F

fababeans	FBN
fair colour	FCLR
fairly good colour	FGCLR
fairly sound	FSND
fairly sweet	FST
feed	FD
falling number	FN
fertilizer	FERT
fertilizer pellets	FERT PLTS
Finale	FNLE
fireburnt	FBNT
flaxseed	FLX
flax pellets	FLX PLTS
fm is excluded as a grading factor	FMXGF
food	FOOD
foreign material	FM
foreign material excluding cereal	FMXCGRN
foreign material excluding cereal grains and wild oats	FMXCGRNWO
foreign material excluding grain	FMXGRN
foreign material excluding other grains	FMXOG
foreign material excluding other cereal grains	FMXOCG
foreign material not grain	FMXGRN
frost	FR
frost/heat stress	FRHTS
frost light	FRL
frost severe	FRS
frost total	FRT
fusarium damage	FUS DMG
fusarium mould	FUS MLD

G

General Purpose	GP
germination	GERM
good natural colour	GNCLR
grade	GRD
grading factor	GRDFAC
grade improvement	GRDIMP
graded according to 1993/94 specifications	GAS
grain	GRN
gram	g
grass green	GRASS GR
grasshopper, army worm	GAW
grasshopper parts	GPT
grey hilum	GHIL
great northern	GTN
green	GR
green peas	GRPEA

guaranteed	G

H

handpick	HP
handpick coarse material	HPCURSMTL
handpick earth pellets	HP EP
handpick foreign material	HP FM
handpick hulled seed	HP HULL SD
handpick inseparable material	HP INSPMTL
handpick other grain	HP OG
handpick roughage	HP RHGE
handpick vegetable matter	HP VM
hard red spring	HRS
hard red winter	HRW
hard vitreous kernels	HVK
hard white spring	HWS
hard white winter	HWW
heated	HTD
head rot	HEAD ROT
heated binburnt	HTDBBT
heavy	HVY
held	HLD
hp coarse material	HPCURSMTL
hulled/hulless	HULL
hulled and broken	HULLBKN
hulls	HULLS

I

identity preserved	IP
immature	IM
inconspicuous admixture	INC ADMX
inert material	INERT MTL
Indianhead	INDNHD
inferior variety	INF VAR
injurious seeds	INJ SDS
insect damage	I DMG
insect excreta	I EXCR
insect parts	I PARTS
inseparable admixture	INSEPADMX
inseparable seeds	INSEP SDS
invisible loss	INV

K

kernels	KRNL
kilograms	kg
kilograms per hectolitre	kg/hl
knuckles	KNKLS
knuckles and straw	KNKL&STR

knuckles, straw and chaff	KNKLSSTRCHF

L

lady's thumb	LTHMB
large	LGE
large seeds	LSDS
large seeds and broken grain	LSDS & BKN GRN
large seeds and chaff	LSDS&CHF
large seeds and small seeds	LSDS&SSDS
large seeds left in	LSDS LEFT
large seeds other than wild buckwheat	LSDS XW BWT
lb/bu Winchester	WLB
Lenca	LNCA
lentils	LNT
light	LT
light red kidney	LRK
lightweight	LTWT

M

machine separation	MS
malt barley	MBL
malt pellets	MALT PLTS
maple	MAP
material	MTL
material other than splits	MOTSPLTS
matter other than cereal grains	MOTCG
mechanical damage including splits	MDMGINCSPLTS
midge	MDGE
mildew	MIL
mildewed kernels	MIL KRNL
millet	MLT
mineral matter	MIN MAT
mineral matter including stones	MINMATINCSTNS
mixed	MXD
mixed classes	MXD CL
mixed colours	MXD CLR
mixed grain	MXG
mixed types	MXD TYP
mixed varieties	MXD VAR
moderate weathering	MWEATH
moist	MT
moist sample	MT SPLE
moisture test	MST
mouldy	MLDY
mouldy kernels	MLDY KRNL
mustard seed	MUS
musty	MUSTY

N

natural stain	NSTN
net dockage	NET DKG
no brake end	NBE
non-registered varieties	NON REGV
not commercially clean	NCC
not of good natural colour	NGNCLR
not officially inspected	NOFFINSP
not ready for export	NRE
not reasonably good colour	NREASGCLR
not reasonably sweet	NREASST
not uniform in size	NUS
not well screened	NWSCD
number	NO
numbers	NOS

O

oats	OAT
oat pellets	OAT PLTS
objectionable	OBJ
objectionable odour	OBJ ODOR
ochratoxin	OTA
odd heated	ODD HTD
odour	ODOR
off-colour	OFFCLR
oil	OIL
orange	OR
oriental	ORIENT
other	OTHER
other cereal grain	OCG
other cereal grain and other matter	OCGOM
other cereal grains excluding wheat	OCGXWHT
other cereal grains excluding wheat and barley	OCGXWHT&BLY
other classes	OCL
other classes of beans that blend	OCLBB
other classes of flax	OCLFLX
other classes that blend	OCL BL
other colour bicolour other than mixed soybean	OCLRBICLROTMXDSYB
other colours	OCLR
other conspicuous admixture	OCA
other damaged	ODMG
other distinctly detrimental seeds	ODDET
other foreign material	OFM
other grain	OG
other grain not wheat	OGXWHT
other grains	OGS
other hulless variety	OHLSVAR
other inseparable admixture	OINSEPADMIX

other large seeds	OLSDS
other matter	OM
other pulses	OPLSE
other than	OT
other varieties	OVAR
out of	EX

P

partition	PART
peabean	PBN
peas	PEA
peas of other colours	POOCLR
peeled	PLD
peeled and broken	PLD BKN
peeled, split and broken	PLDSPLTBKN
pelleted	PLTD
pelleted screenings	PLTD SCG
pellets	PLTS
penetrated	PENT
penetrated smudge	PENT SM
perforated	PERF
perforation damage	PERF DMG
Phyto Certificate issued	PHY
pink	PNK
pink kernels	PNK KRNL
pinto	PNT
plump	PLMP
poor colour	PCLR
prairie	PRIE
probe	P
protein	PROT
pulses other than green, yellow or orange peas	PULSESOTGRYELORORGPEA
pure	PURE

Q

quality	QUAL

R

ragweed	RAG WD
rapeseed	RPE
rapid visco analysis	RVA
reasonably good colour	RGCLR
reasonably good natural colour	RGNCLR
reasonably sound	REASSND
red	R
red smudge	RSM
red spring	RS
red winter	RW

registered	REG
rejected	REJ
riddle	RDLE
rotted	ROT
rotted kernels	ROT KRNL
roughage	RHGE
roughage and aspiration	RHGE&ASP
roughage and hulls	RHGE&HULL
roughage including riddle	RGHEINCLRDLE
roughage, large seeds and broken	RHGELSDSBKN
rough awn	RAWN
round-hole	RH
ruptured	RUP
rye	RYE
rye pellets	RYE PLTS

S

safflower	SAF
safflower seed	SAFF SD
said to be	STB
salvage	SLVG
sample	SPLE
sample Canada	SPLE CAN
sample feed grain	SFG
sample spilt	SPLE SPILT
sample too small	STS
sawfly	SFLY
scab damage	SCAB DMG
scanner colour	SCAN CLR
Sclerotinia sclerotiorum	SCL
screenings	SCG
seed	SD
seed coats	SDC
seeds	SDS
seeds and destroyed	SDS&DST
select	SEL
separation	SEPN
severe midge damage	SEVMDGE
severely damaged	SEVDMG
severely mildewed	SEVMIL
severely sprouted	SEVSPTD
shale	SHALE
shrivelled	SHV
shrunken	SHR
sieve	SVE
sieves	SIEVES
six-row	6 ROW
slightly stained	SSTND
slotted	SLTD

slotted sieve	SLTD SVE
slotted sieve #5.5	SL5.5
small	SML
small broken	SBKN
small red	SRD
small seeds	SSDS
small seeds and dust	SSDS&DUST
small seeds, chaff and dust	SSDSCHF&DUST
smooth awn	SAWN
smudge	SM
smudge including blackpoint	SMINCBLKPT
smudge total	TOT SM
smut	SMUT
smutty	SMTY
soft earth pellets	SEP
soft red winter	SRW
soft white	SW
soft white spring	SWS
sorghum	SRG
sound	SND
sound whole green peas	SNDWHGRPEA
sound whole yellow peas	SNDWHYELPEA
soybeans	SYB
soybeans of other colours	SOOCLR
special	SPEC
special bin	SPEC BIN
special cleaning	SCLN
special machine separation	SMS
special select	SPECSEL
split	SPLT
split green peas	SPLTGRPEA
split yellow pea	SPLTYELPEA
splits	SPLTS
splits, damage, foreign material and contrasting classes	SPDMGFMCC
splits in dockage	SPLTSDKG
spring	SPG
sprouted	SPTD
stained	STND
stained kernels	STND KRNL
standard	STD
starchy	STCH
stones	STNS
straw	STRAW
strong	STG
subject to grade	SGD
submitted	S
sunflower	SUN
sunflower seed	SUN SD
superficial discolouration	SUPDISCLR

T

Tara	TARA
Tartarian buckwheat	TART BWT
test weight	TWT
thin	THIN
thin (5/64x3/4 slotted)	THIN(5/64X3/4)
tombstone	TOMBST
tonne	t
total	TOT
total adhered hulls	TOTADHHL
total attrition and seeds	TATT&SDDS
total broken	TBKN
total bleached including copper	TBLCHINCCOP
total cockle and sclerotia	TCOCSCL
total cockle and sclerotinia	TCOCSCL
total conspicuous admixture	TCA
total cracked seed coats including splits	TCSDCISPLT
total damage	TDMG
total damage and foreign material	TDMG&FM
total damage, foreign material, contrasting classes	TDMGFMCON
total damage including wrinkled	TDMGINCWRKL
total damage, splits, foreign material and contrasting classes	TDMGSPFMCN
total distinctly detrimental	TDD
total dockage	TOT DKGE
total foreign material	TFM
total foreign material including dockage	TFMINCDKG
total foreign material including other cereal grains	TFMINCOCG
total foreign material including sclerotia	TFMINCSCL
total including contrasting classes	TINCCONCL
total including damage, foreign material and contrasting classes	TINCDMGFMCONCL
total including inseparable seeds	TINCINSEPSDS
total including non-registered varieties	TINCNONREGVAR
total including splits, damage, foreign material and contrasting classes	TINCSPLTSDMGFMCONCL
total inseparable seeds	TINSEPSDS
total large seeds and wild oats	TLSD&WO
total other cereal grain	TOCG
total other classes and bleached	TOCLBLCH
total other oilseeds and inseparable seeds	TOOSDSINSEPSDS
total removable material	TRMAT
total roughage	TOT RHGE
total small seeds, large seeds, wild oats, roughage, broken grain	TSDLSWORB
total seeds and aspiration	TSDS&ASP
total seeds and attrition	TSDS&ATT
total seeds and roughage	TSDS&RHGE
total seeds and wild oats	TSDS&WO
total seeds roughage and attrition	TSDSR&A
total shrunken and broken	TSHRBKN
total small seeds and roughage	TSSDS&RHGE
total small seeds, attrition, dust and chaff	TSSDSATTDUSTCHF

total small seeds, chaff, dust and hulls	TSSDSCHFDUST&HULLS
total small seeds, roughage and attrition	TSSDSR&A
total smudge	TOT SM
total smudge and blackpoint	TSMBLKPT
total splits and damage	TSPLT DMG
total sprouted	TSPTD
total wheat heads knuckles straw and chaff	TWHDKNSTCF
total wheat of other classes	TWOOC
tough	TF
tough sample	TF SPLE
tough sample canada	TF SPLE CAN
trace	TR
trace heated	TR HTD
trailer	TRLR
Trapper	TRAP
triticale	TCL
Triumph	TRPH
truck	TRCK (T with EIS)
two-row	2 ROW

U

unapproved variety	UNA VAR
United States of America	USA
utility	U

V

varietal purity not guaranteed	VPNG
variety	VAR
varieties with adhered hulls	VARADHHLS
vegetable matter	VM
very immature seeds	VIM SDS
vomitoxin	DON

W

warehouse	WHSE
weathered	WEATH
weed seeds in handpick	WDSDS HP
weight	WGT
western	W
wet	WT
wet sample	WT SPLE
wheat	WHT
wheat class declared by shipper	WCD
wheat heads	WHT HDS
wheat of other classes	WOOC
white	WTE
white cap	WCAP
white hilum	WHIL

white hilum grain	WHIL GRN
white kidney	WKD
white winter	WW
whole grain	WHOLE GRN
whole green pea	WHOLE GRPEA
whole yellow pea	WHOLE YELPEA
wild buckwheat	W BWT
wild mustard	WM
wild mustard and canola/rapeseed	WM&CNL/RPE
wild mustard and rapeseed	WMRPE
wild oats	WO
winchester bushel	lbs/bu W
winter	WIN
wrinkled	WRKL

Y

yellow	YEL
yelloweye	YLE
yellow-seeded flax and solin	YELSDFLXS

Z

zearalenone	ZER

27. Glossary

This section describes grading factors, procedures and common terms used in grading Canadian grain.

AAFC

Agriculture and Agri-Food Canada, the federal department of agriculture.

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aeration

Aeration is the process of passing air currents through a grain stream. This process is used to remove objectionable odours or to preserve grain quality by reducing its temperature or moisture content.

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armyworm damage

See insect damage.

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ascochyta blight

Ascochyta blight is a fungal disease that attacks the leaflets, stems, petioles, pods, and seeds of lentil. Heavily infected seeds usually are characterized by a half-moon shaped, light to reddish or reddish brown spot on the edge of the seed. Occasionally it appears as a brown spot on the cheek of the seed.

Ascochyta blight was first reported in Canada in 1978 and has subsequently become a serious problem. It causes yield losses and severe seed discolouration in epidemic years.

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attritional material

Attritional material is material other than small seeds and broken grain passing through the No. 4.5 round-hole sieve.

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automatic mechanical sampler

An automatic mechanical sampler is a device which extracts a small representative portion from the grain flow at regular intervals.

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average samples

Average samples represent the visual quality of a grade of grain in a specific location at the end of a time interval. Average samples are composited to create official carlot unload samples, cargo samples or submitted samples, by elevator, by port, or by inspection district. They provide a means of monitoring grade levels and specific grading factors.

Berlese funnel

A Berlese funnel is a device for collecting insects.

Grain suspected of being infested is placed in the funnel. The funnels used by Industry Services hold up to one kilogram of grain. The funnels are placed under lights. Insects move away from the lights down the funnel and are collected in receptacles placed under the funnels.

binburnt kernels

Binburnt kernels closely resemble fireburnt kernels in colour. However, in cross section, the binburnt kernel maintains its dense structure and appears smooth and glossy, unlike a fireburnt kernel, which looks like charcoal in cross-section, has numerous air holes, and crumbles easily under pressure.

Binburnt kernels are caused by gradual heating in storage and have not been exposed to temperatures approaching ignition.

The weight of a binburnt kernel is similar to that of a sound kernel of comparable size.

blackpoint

Blackpoint is a discolouration on the germ end of kernels of grain caused by numerous species of fungi and bacteria. Blackpoint is found in barley, triticale and wheat, although there is no separate tolerance defined for blackpoint in barley.

Kernels are susceptible during periods of rainfall or humidity above 90%, particularly during filling or maturation.

Blackpoint does not usually reduce yields, but it can reduce grade and quality. Blackpoint is especially troublesome on durum wheat because black specks can appear in the semolina.

bleached

Bleaching is an indication of exposure to wet conditions at or near maturity. Bleaching is caused by alternate wetting and drying of grain which causes tiny fissures to develop throughout the kernels. The fissures are caused because the grain swells a little when it is wet and doesn't dry back to the same size.

brake end

The brake end is the end of a railway car where the hand brake wheel is located. Compartments or partitions in a railcar are numbered sequentially beginning at the brake end.

Brassica carinata

Commonly known as ethiopian mustard, *Brassica carinata* is a small oilseed that is similar in size and shape to canola and domestic mustard seed. Varieties range in colour from brown to yellow and have high erucic acid content similar to mustard seed or rapeseed. *Brassica carinata* may not be readily distinguishable from other small oilseeds without the use of a microscope.

bunt

Bunt is characterized the presence of bunt balls or black spores. Infected grain may have a fishy odour. Common bunt is a wheat disease caused by two closely related fungi, *Tilletia caries* and *Tilletia foetida*. The disease is also called stinking or covered smut. In infected plants, kernels on headed plants are replaced with bunt balls containing black powdery spores of the fungus.

Bunt reduces yield of infected crops, and it reduces the value of the crop, even in mildly infected crops. It is not as common as it once was in Canada, because we have developed effective control measures and new cultivars that are resistant to the disease.

Canada Eastern, Canada Western, Canada

These three terms form part of the grade name; for example, Canada Eastern White Spring wheat, or Canada Western select barley. The terms refer to the geographic area (eastern or western Canada) of production as defined in the Canada Grain Act, or to Canada generally.

Canada Grain Act

The Canada Grain Act is the statutory authority empowering the CGC to regulate grain handling in Canada and to establish and maintain quality standards for Canadian grain. It was first passed in 1912. The text of the Act can be found through the CGC web site at www.grainscanada.gc.ca.

Canada Grain Regulations

The Regulations are established by Section 116 of the Canada Grain Act. They govern grain-handling procedures and define grades for grain grown in eastern and western Canada.

canola

The term "canola" was trademarked in 1978 by the Western Canadian Oilseed Crushers' Association to differentiate the new superior low-erucic acid and low-glucosinolate varieties and their products from older rapeseed varieties.

cargo sample

A cargo sample is a composite of average samples taken as a cargo is loaded into a ship for export. Cargo samples are inspected and graded, and portions of them are sent to the Grain Research Laboratory for analysis.

caryopsis

The caryopsis is the kernel of cereal grains and grasses with the hull removed. See *groats*.

cash purchase ticket

A cash purchase ticket is a ticket issued indicating the grade, weight, price and amount payable to the owner of the grain for each delivery of grain to a primary elevator, process elevator or grain dealer. The ticket is a negotiable instrument and can be cashed at any chartered bank or credit union. It is defined in the Canada Grain Act.

cereal grains

Cereal grains are wheat, rye, barley, oats and triticale.

certificate

The CGC issues a number of certificates assuring grain quality. These include

- Inspection certificate, issued following an official inspection of a sample of grain
- Certificate Final, issued on cargoes of grain for export, stipulates the grade and weight of the grain
- Submitted sample certificate, issued for a submitted sample

Certificate Final

The Certificate Final is issued by the CGC for each cargo of export grain. The Certificate Final stipulates the grade and weight of the grain loaded on a vessel.

chlorophyll

Chlorophyll is the green pigment found in all green plants. It is essential for photosynthesis. In canola, seeds lose their chlorophyll as they ripen. However, canola seeds do not all ripen at once. Therefore in harvested canola, some seeds may still contain some chlorophyll.

class

Classes are defined under the Canada Grain Act. Class, in respect of grain, means any variety or varieties of grain designated by order of the CGC as a class.

commercially clean

Commercially clean shipments are shipments of grain whose dockage falls within allowed limits and is of a type normally present after standard commercial cleaning.

Commission

The Canadian Grain Commission is referred to as the CGC. The Chief Commissioner of the CGC reports directly to the Minister of Agriculture.

Commission Order

A Commission order is a directive of the CGC consistent with Section 118 of the Canada Grain Act. An order remains in effect only until the end of the crop year in which it is issued. Orders can be viewed from the CGC web site at http://www.grainscanada.gc.ca/Regulatory/regmenu-e.htm#orders.

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composite sample

A composite sample is composed of a number of distinct portions, each obtained in a prescribed manner from consecutive samples. The portions are blended to make the composite.

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consecutive samples

Consecutive samples are samples taken one after another in a prescribed manner from the same lot of grain.

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contaminated grain

▲ **Important:** Wear gloves and a mask to handle any sample that is suspected of containing contaminated grain.

Contaminated is defined in the *"Canada Grain Act"* as; "Contaminated means, in respect of grain, containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations made pursuant to sections B.01.046(1), B.15.001 and B.15.002(1) of the *Food and Drugs Act*."

Determination as to whether grain is contaminated will be made by the Grain Research Laboratory in consultation with the Chief Grain Inspector for Canada. Samples deemed to be contaminated are graded *"Type of Grain,* Sample Condemned.

Paragraph 76. (1) of the Canada Grain Act specifies that operators of licensed terminal elevator must inform the CGC if they find grain to be infested or contaminated, or to have gone or to be likely to go out of condition or otherwise to require treatment. The CGC may inspect the grain.

The CGC tells the operator how to treat or dispose of the grain. If the grain has been special binned, the elevator operator may recover the costs of treating or disposing of the grain from the owner of the grain.

Paragraph 90. (1) says that a CGC inspector who believes on reasonable grounds that grain is contaminated may sieze any evidence necessary to support their suspicion. Paragraph 104 says that an operator of a licensed elevator must not knowingly receive or discharge any grain, grain product or screenings that is infested or contaminated or that may reasonably be regarded as being infested or contaminated

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cool and sweet

Cool and sweet are terms used to describe the condition of grain which is of a normal temperature and is free from any objectionable odour.

cotyledon

The portion of an oilseed or pulse crop seed that is beneath the seed coat or hull. Grading factors may be assessed based upon an examination of the cotyledon surface or a cross-section of the seed.

coarse vegetable matter

Coarse vegetable matter is plant based material handpicked from the sample such as pods, stems, straw, thistle tops and wheat heads, but not domestic or wild seeds.

Cox funnel

A Cox funnel is used in determining test weight in conjunction with the 0.5-litre measure to control the flow of grain into the measure.

crop year

The crop year is from July 1 to June 30 of the following year in Eastern Canada and August 1 to July 31 of the following year in Western Canada, as defined in the Canada Grain Act. The Governor in Council may, by order, vary the period of a crop year to another period of not less than three hundred and sixty-five days.

damp

A sample of grain is identified as damp if the moisture content exceeds the tough range defined for that class of grain. In terms of moisture content, grain is classified as straight, tough, or damp. For corn, soybeans, sunflower seed and safflower seed, there are two additional classes of moisture content, moist and wet.

darkened kernels (amber durum)

Darkened kernels (amber durum) – Darkened kernels are similar in appearance to penetrated smudge with the exception that discolouration is gray to charcoal in colour rather than red to dark brown.

For grading purposes, darkened kernels should be considered as, and in conjunction with severe midge damage.

dehulled

Occasionally used for *hulled*.

direct hit shipment

Direct hit shipments are those shipments where Canadian grains, oilseeds and/or pulses are transferred from trucks and/or railcars directly to a vessel without added processing.

direct shipment

A direct shipment is an export movement from a terminal elevator. The grain being loaded will be exported from the country.

dockage

According to the Canada Grain Act, dockage is material that must be removed from grain by the use of approved cleaning equipment so that the grain can be assigned a grade. Once it has been removed from the grain, dockage is called *screenings*.

To report the percentage by weight of dockage in a sample,

For . . .	dockage is . . .
grain that is not commercially clean	reported in increments of 0.1%
eastern grains	assessed to the nearest 0.1%
export shipments authorized by the CGC to contain dockage	reported to the nearest 0.1%
grain graded *Sample Salvage, Sample Canada/CW/CE Account Fireburnt, Sample Condemned*	not reported
samples of official carlot or trucklot shipments containing dockage within established export limits for commercial cleanliness; for example, domestic buckwheat, 2.5%	what is normally present after ordinary commercial cleaning—there is no minimum canola, 2.5%, or dockage
off-grades	dockage is covered in the section describing the specific class of grain

Allowances are made for finely broken seeds in indirect export shipments.

earth pellets

Earth pellets are a type of foreign material found in grains.

Soft earth pellets include soft fertilizer pellets, except in domestic mustard seed, and any non-toxic material of a similar consistency. Earth pellets remaining in cleaned samples are handpicked and, up to specified tolerances, their percentage by weight is added to the percentage by weight of dockage in domestic shipments to terminals. Export shipments must be practically free from earth pellets.

Hard earth pellets are stones.

Eastern and western grain, mixed

Mixtures of eastern and western grain, except for corn, are graded *[class of grain] Sample Eastern and Western Mixed*. When the composition of the samples is known or can be established by analysis, it is recorded on the back of the inspection certificate.

Separate lots of western corn may be loaded to vessels without separation at the request of shippers.

elevator

Licensed grain elevators are of three types: primary, process and terminal.

End-use certificate

End-use certificates are issued upon request for grain imported into Canada as prescribed under the Canada Grain Act.

ergot

Ergot is a fungal disease which occurs on cereals and grasses. It is most prevalent on rye, triticale, wheat, and barley, in decreasing order of occurrence. It is rarely found on oats. The disease produces hard dense fungus bodies, called *sclerotia*, having a purplish black exterior, a purplish white to off-white interior, and a relatively smooth surface texture.

experimental grades

Experimental grades are established to provide the Canadian Agricultural entities a way to market new varieties of wheat to assess their acceptability in world markets.

export ready

Export ready refers to carlots which meet the following criteria:

1. The lot must meet the commercially clean specifications for the grade
2. Wheat of other classes and contrasting classes must meet the export specifications for the grade
3. Total foreign material must meet the export specification for the grade.

Carlots, which are commercially clean but do not meet the export specifications for either wheat of other classes or total foreign material, will be designated as "Not Ready for Export".

extraneous material

Can be defined as glass, metal, wood, plastic or any other material not already defined in the Official Grain Grading Guide.

Note: Canadian Grain Commission personnel should refer to ISO national work instruction "*Suspect Contaminated Grain, Handling Procedures*" for specific procedures to be followed when handling samples suspected of containing extraneous materials.

fair average quality (FAQ)

FAQ is a term used in grain marketing in some countries to describe the current year's grain quality on the basis of an average sample. The FAQ is a class of grain which is said to represent the quality of a commodity produced in a given year. FAQ standards of quality may change from year to year.

falling number

The falling number is a measure of enzyme activity as a result of sprouting. It is a measure of how many seconds it takes for a plunger to sink through a paste made of ground grain and water.

The test works on the principle that the presence of alpha-amylase causes the gelatinized starch to be reduced to sugars, with a loss of viscosity. The loss in viscosity results in a lower falling number. Samples of grain with high amounts of alpha-amylase will have a falling number of around 70 seconds. Grain which is sound and has low levels of enzyme will have a high falling number, for example, 350 seconds.

fireburnt kernels

Fireburnt kernels are kernels burned or scorched by fire. A cross-section of a fireburnt kernel resembles charcoal, with numerous air holes. These air holes result in a low-weight kernel which crumbles easily under pressure.

The Off-Grades of Grades of Grain and Grades of Screenings Order excludes from any Class I or Class II grade any grain having a fireburnt odour or containing fireburnt kernels in excess of established tolerances, because it is not possible to separate all kernels affected by smoke or heat from samples containing grain damaged by fire.

foreign grain

If the inspector suspects that a sample or shipment of grain is not of Canadian origin, the shipper must provide a letter indicating the country of origin, before official grading occurs.

Unofficial samples

Inspection services may be provided for samples of foreign grains. Certificates or letters must clearly indicate that the grade provided is the grade the sample would qualify for if the grain had been of Canadian origin.

Official samples, terminal receipts

Inspection records and certificates specify the class of grain and, in place of the grade, the country of origin. For example, *Corn, USA origin.*

foreign material

Foreign material is material other than grain of the same class that remains in the sample after the removal of dockage. Some examples of foreign materials found in grain samples are

- Cereal grains, sometimes called other cereal grains
- Earth pellets, soft
- Ergot
- Fertilizer pellets, hard
- Large seeds
- Matter other than cereal grains
- Roughage
- Sclerotinia
- Small oilseeds
- Small seeds
- Stones

Many of the materials, such as stones, ergot, and sclerotinia have separate tolerances. Foreign material reduces the value—there is less desired grain for the weight or volume purchased. In addition, the presence of foreign material in grain compromises our reputation for clean grain.

Even the presence of other cereal grains can compromise the quality of the predominant grain. For example, the presence of barley in wheat reduces milling yield. Oats in red spring wheat reduces milling yield and gives the flour a duller colour.

free fatty acids

Oilseed quality is determined in part by the free fatty acid test.

Free fatty acids are components that reduce the smoke point in frying fats and oxidize rapidly, giving rancid flavours.

The test gives a direct measure of the processing qualities of the oil and the amount of lye required to refine oils. Top canola seed usually has less than 0.7% free fatty acids. International specifications for top grade oil are usually set at 2.0% free fatty acids.

frost damage

The severity of frost damage depends on the stage of maturity of the grain, the temperature to which the grain is exposed, and the duration of exposure.

In wheat, as the degree of frost damage increases,

- Wheat milling becomes more difficult
- Flour yield decreases
- Flour ash content increases
- Flour colour becomes darker, which may not be commercially acceptable
- Bread volume, appearance, crumb structure and crumb colour deteriorate

fusarium head blight

Fusarium head blight is a fungal disease of wheat and other cereal crops.

In wheat it is characterized by the presence of kernels that appear lifeless, thin and shrunken. The kernels show a whitish or pinkish fibrous mould usually occurring in the crease area but sometimes found in the germ of the kernel as well. The presence of the mould on individual kernels is confirmed using a 10-power magnifier.

Fusarium may produce mycotoxins such as vomitoxin. Affected grain may be unpalatable or toxic to animals, and is considered acceptable for human consumption only when virtually free of mycotoxins.

glucosinolates

Glucosinolates are natural components of canola, rapeseed, and mustard seed. These compounds are responsible for the pungent odour and sharp flavour of cabbage, brussels sprouts, radishes, broccoli and cauliflower. They are natural toxicants, associated with goitre and liver damage when consumed in large quantities.

Glucosinolates may be desirable in mustard seed destined for condiment use. However, high levels in rapeseed restricted the use of this seed for feed. Breeding programs to reduce the level of glucosinolates in rapeseed produced canola.

grade certificate

A grade certificate attests to the quality of a commodity graded by official inspectors, testers and graders. It is another name for inspection certificate.

grade code

A grade code is a four-digit code used throughout the grain industry to identify each grade of each class of grain. See also *grain code*.

grades of grain

Grades of grain are defined by specifications in

- The Canada Grain Regulations
- The Official Grain Grading Guide
- Orders of the Canadian Grain Commission

Class	**Authority**	**Example**
I	Canada Grain Regulations	*Wheat, No. 1 Canada Western Red Spring*
II (special grades)	Canada Grain Regulations Orders of the Canadian Grain Commission	experimental grades Brassica Juncea Canola, Canada
III (off-grades)	Off-Grades of Grain and Grades of Screenings Order	tough, damp, rejected and sample grades
IV (screenings)	Off-Grades of Grain and Grades of Screenings Order	*Screenings, No. 1 Feed*

grading factor

A grading factor is a physical condition of grain, the result of growing conditions, handling procedures or storage practices. It is a visual characteristic that indicates a reduction in quality; for example, frost damage, sprouted kernels, or heated kernels. Only relevant grading factors are shown as reasons for a grade.

- If a sample of wheat grades No. 3 for one particular reason, there is no need to list other factors that might be acceptable in a higher grade.
- If the sample is No. 3 for a combination of reasons, the combination must be shown in order of importance.

grain

A grain is any seed named in the Canada Grain Act or designated by the Canada Grain Regulations as a grain.

grain code

A grain code is a two-digit code used throughout the industry for each class of grain. See also *grade code*.

grasshopper damage

See insect damage.

groats

Groats are hulled grains, and refer to the caryopsis of domestic or wild oats; that is, it is the kernel with the hull removed.

hard vitreous kernels - HVK

Vitreousness is the natural translucence of a kernel that is a visible sign of kernel hardness. Hard vitreous kernels (HVK) are a grade determinant for the amber durum wheat class in Canada and the red spring wheat class in western Canada.

HVK content is related to protein content and milling quality, which are particularly important in durum wheat. Non-vitreous kernels are produced under cool maturation conditions, abundant soil moisture and insufficient nitrogen. Flours milled from non-vitcous wheat have reduced protein content and produce poor loaf volumes. Non-vitreous kernels are not as significant in soft wheats, since low protein is desirable for most soft wheat end-products.

hazardous substance

A hazardous substance is defined in the Regulations as any pesticide, herbicide, desiccant or inoculant.

hilum

The scar on a seed marking the point of attachment to its seed pod.

hulled

Hulled kernels have the hulls removed, e.g., oat groats, peeled barley and hulled sunflower seeds.

hulless

Hulless kernels have naturally loose hulls or no hulls, e.g., wheat, hulless oats and barley.

identity-preserved

In a primary elevator, identity-preserved or special bin grain is held in a separate bin at the request of the owner.

immature

Immature kernels are kernels that have not fully ripened. The physical effect is dependant on the timing, cause and extent of the exposure to environmental conditions during the growth cycle. The kernel growth has been affected or arrested during the maturation process often resulting in variation in colour, size and shape.

indirect shipment

An indirect shipment is a domestic movement from a terminal elevator. The grain will be reloaded at a terminal elevator along the St. Lawrence for delivery to the buyer.

insect damage

For CWRS, CWHWS and CWAD, there are specific limits for kernels damaged by grasshopper and armyworm, midge and sawfly.

Grasshopper and armyworm damage

Grasshoppers and armyworms chew out sections of kernels, particularly the ends and sides. At an early stage, armyworms may chew tunnels through the kernels. This destroys the endosperm, and leaves the exposed chewed areas susceptible to fungal and bacterial infections. Heavy discolourations and moulds may result.

Orange wheat blossom midge

The orange wheat blossom midge causes a distinct form of damage. Grade tolerances for midge have existed for many years based primarily on the shrivelling and distortion of midge-damaged kernels. The tiny midge larvae feed directly on the developing kernels in the heads of wheat. The extent of damage largely depends on the number of larvae feeding on each kernel.

The full effects of midge damage on Canadian red spring bread wheat quality have been studied, revealing the seriousness of midge damage to quality. The shrunken distorted grains reduce flour yields and produce dark flours with increased flour ash. Severely midge-damaged wheat exhibits weak, sticky dough properties, low baking absorption and poor bread quality. Protein content is abnormally high, but gluten protein quality is distinctly inferior.

insect infestation

The Canada Grain Regulations establish procedures for handling infested grain at primary elevators. Grain found infested at terminal elevators is handled and treated under the direction of an officer of the CGC.

According to the Canada Grain Act, infested grain is grain that contains any injurious, noxious or troublesome insect or animal pest.

insect parts

Insect parts refers to pieces of insects such as grasshoppers and lady bugs that remain in the sample after cleaning or processing. Samples are analyzed for the percentage of insect fragments and graded according to established tolerances.

If pulse crops come into contact with insects during the harvesting process, it may result in seed staining and earth adhering to the seed and may result in samples having an objectionable odour. Samples containing staining of this nature will be considered to be earth tagged and graded according to colour definitions. Samples having a distinct objectionable odour not associated with the quality of the grain will be graded *Type of Grain* Sample Account Odour.

inspection certificate

A CGC grain inspector issues an inspection certificate following an official inspection of a sample of grain. The certificate must state

- Where the grain was grown in Canada
- The grade according to the Canada Grain Act
- Dockage
- Other relevant information

invisible losses

Invisible losses are normal losses of weight of grain during normal handling.

Invisible weight losses are primarily from

- Dust losses during handling
- Moisture losses during storage
- Unexplained weight losses in oilseeds during storage

iodine value

Iodine value is a measure of the total amount of unsaturated fatty acids in an oil. In flaxseed, iodine values of 189 or greater are required for the manufacture of paints and inks. Lower values, around 182, are needed for the manufacture of linoleum.

K

The letter K in grade tables refers to the number of kernels or kernel-sized pieces of a particular grading factor in a 500-gram sample.

laker

A laker is a long, shallow draft ship designed to transport cargoes within the inland water system of the St. Lawrence Seaway.

large seeds

Large seeds are considered foreign material in some classes of grain. Large seeds include domestic and wild seeds with the exception of cereal grains and wild oats that remain on top of the No. 4.5 round-hole sieve.

manufactured products

Manufactured products are materials other than grain cleanings and includes materials such as malted, crushed, or ground grain which cannot be assigned a grade. Inspection may be performed on request. Certificates issued have only the composition endorsed on the back, providing the identification of the components is unquestionable; for example, *80% crushed wheat, 15% crushed barley, 5% whole wheat.* On the face of the certificate, *Manufactured product* is indicated.

marine leg

A marine leg is a mechanical device used to offload bulk grain from the hold of a vessel, normally from a laker into a terminal elevator along the St. Lawrence.

midge damage

Midge damage is found mostly in wheat, although it has been detected in barley, rye, and some grasses.

The only part of the plant damaged is the developing seed. When a kernel of grain is attacked either it will not develop or it will develop as a shrivelled, deformed kernel. Infestations of the wheat midge can significantly reduce yield. They are most severe when rainfall is high during the spring or summer.

See *insect damage*.

mildew

Mildew is a fungal condition that affects wheat, barley and a number of other grains. It develops in unthreshed kernels of grain, usually under conditions of excessive moisture. It should not be confused with the disease powdery mildew, which attacks the leaves, reducing yield.

Downy mildew, caused by *Peronospora manshurica*, can sometimes form a white coating on soybeans. These are spores of the fungus. They do not affect the processing or safety of the seed, but can affect the appearance.

mineral matter

Mineral matter refers to stones, earth pellets, fertilizer and screening pellets that may be found in samples of grain.

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moist

A sample of grain is identified as moist if the moisture content exceeds the *damp* range established for that class of grain.

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moisture content

Moisture content is a measure of the water content of grain.

Grain that is within acceptable limits of moisture is referred to as a straight grade. With increasing moisture content, grain may be referred to as *tough, damp, moist* and *wet*. See Chapter 2, *Moisture testing*.

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mycotoxins

Mycotoxins are poisonous substances produced by some species of fungi.

For example, several Fusarium species can cause a disease called fusarium head blight. One of the more important species of fusarium, *Fusarium graminearum*, can produce several mycotoxins, most commonly, deoxynivalenol or vomitoxin, which, when present in feed grain, is distasteful and can reduce the rate of weight gain in some animals.

In corn, *Fusarium graminearum*, also called *Gibberella zeae*, causes the disease gibberella ear rot. Besides deoxynivalenol, another compound known as zearalerone may be formed. This compound has estrogen-like effects, especially in pigs and cattle.

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non-vitreous

See hard vitreous kernels (HVK).

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not commercially clean

Shipments of grain whose dockage content falls outside of allowed limits.
See *commercially clean*.

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objectionable odour

An objectionable odour is one not normally associated with grain, such as skunk, sour, musty, oil, or gas. Heated or fireburnt odours are identified specifically and not included in the general category of objectionable odour.

Off-Grades of Grain and Grades of Screenings Order

The Off-Grades of Grain and Grades of Screening Order is issued by the CGC. It provides the authority for the application of the grading terms rejected, sample, tough,damp, moist, and wet, and defines grades of screenings.

The Off-Grades of Grain and Screenings Order is available through the CGC web site at www.cgc.ca. The direct address is http://www.grainscanada.gc.ca/Regulatory/regmenu-e.htm#orders

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official carlot unload sample

An official carlot unload sample is a sample taken by a CGC grain inspector or by any sampling device authorized by the CGC as a railcar is unloaded at a terminal elevator.

official inspection

An official inspection is done when an official sample of grain is graded by a CGC inspector.

official sample

An official sample is a sample of grain taken from a parcel of grain by a person authorized by the Commission to take the sample or by any sampling device authorized by the Commission.

oilseeds

Oilseeds include flaxseed, canola and rapeseed, soybeans, safflower and sunflower seed.

optimum representative portion

The representative sample size within the minimum and maximum range used to obtain the most accurate result when assessing an objective factor. The optimum representative portion is determined by taking into consideration the tolerance and concentration of the objective factor being assessed.

Order of Precedence

The following list is used to assign reasons for *Sample* grades.

1. Sample Account Admixture, Contaminated grain
2. Sample Salvage
3. Sample Account Fireburnt
4. Sample Account Excreta
5. Sample Account Fusarium
6. Sample Account Ergot
7. Sample Account Odour
8. Sample Account Rotted
9. Sample Account Heated
10. Sample Account Mildewed
11. Sample Account Damaged
12. Sample Account Damage and Foreign Material
13. Sample Account Dehulled
14. Sample Account Stained Kernels
15. Sample Account Sprouted
16. Sample Account Admixture
17. Sample Account Splits
18. Sample Account Lightweight
19. Sample Account Stones
20. Sample Account Mixed Colours

other cereal grains

A cereal grain mixed into another type of cereal grain is considered foreign material. The presence of other cereal grains affects the processing quality of the main grain.

In ...	other cereal grains are ...
wheat	rye, barley, oats, triticale
rye	wheat, barley, oats, triticale
barley	wheat, rye, oats, triticale
oats	wheat, rye, barley, triticale
triticale	wheat, rye, barley, oats

For grading purposes, spelt and Kamut® are considered as *Other cereal grains* in samples of wheat, rye, barley, oats and triticale.

other matter

Other matter refers to inseparable material excluding cereal grains, large seeds, wild oats, stones, mineral matter, ergot and sclerotinia.

out of condition

Grain which is out of condition has deterioriated in storage. Grain that is damp, heating or spoiling in storage requires special treatment such as drying or aeration to preserve its quality or to prevent further deterioration.

Paragraph 76. (1) of the Canada Grain Act specifies that operators of licensed terminal elevator must inform the CGC if they find grain that is or is likely to go out of condition. The CGC may inspect the grain. The CGC tells the operator how to treat or dispose of the grain. If the grain has been special binned, the elevator operator may recover the costs of treating or disposing of the grain from the owner of the grain.

pass-on slip

A pass-on slip is a document given to the captain or mate of a vessel by the CGC inspector when grain is loaded into the vessel from a terminal elevator.
The information on the slip includes the vessel name, exact storage of all grades of grain loaded, a diagram of the stowage plan, the date, and the loading terminal. This slip is collected by the inspector in charge of the next loading elevator.

primary elevator

A primary elevator is a licensed elevator used to accept deliveries of grain directly from producers for storage or forwarding.

primary sample

A sample representing a lot of grain other than those discharged from a terminal elevator or process elevator.

process elevator

A process elevator is an elevator which is used principally to receive and store grain for processing directly into other products.

processed sample

A processed sample is a sample of grain that meets the commercially clean definition. See *unprocessed sample*.

producer car

A producer car is a railcar that is loaded and shipped by a producer to a terminal elevator. Producers apply to the CGC to have a railcar allocated to them.

pulses

Pulses are crops grown for their edible seeds, such as peas, lentils, chick peas or beans.

red smudge

Red smudge is a dark reddish discolouration usually associated with durum wheat. It usually affects the entire bran portion of the kernel. Discolouration is not superficial and cannot be removed through abrasion. Red smudge is caused by infections of the fungus *Pyrenophora tritici-repentis*, which also causes the leaf disease tan spot.

registered variety

A registered variety is a variety of grain registered under the authority of the Canada Seeds Act and listed on the Variety Order List.

Regulations

Canada Grain Regulations. The Regulations can be viewed through the CGC web site at www.grainscanada.gc.ca

The direct address is http://www.grainscanada.gc.ca/Regulatory/Regulations/regs1-e.htm.

rejected grades

Rejected grades are defined in the Off-Grades of Grain and Grades of Screenings Order. The term is not used in grading eastern grain. Numerical grades of western grain may be graded rejected only because of stones. If the stones are removed, the Rejected designation is dropped.

representative sample

Grades are based on samples. To ensure samples adequately reflect the entire lot of grain, proper sampling procedures must be used. Official samples are taken using continuous sampling devices. The CGC publishes a factsheet on sampling procedures, called *Taking a Representative Sample*.

retention time

See *storage of samples*.

rotted	Rotted kernels are decomposed or decayed because of bacteria or fungi. Rot is usually indicated by blackening, discolouration and softening of all or part of the kernel.
roughage	Roughage is a type of foreign material found in grains. It includes chaff, loose hulls, empty seed pods, knuckles, etc., that are readily removable by aspiration, handpicking, or other cleaning procedures.
running sample	A running sample is a sample obtained while grain is being conveyed on a belt or as it flows from a spout.
saltie	A saltie is a vessel designed for ocean navigation.
sample	A sample is a portion of grain taken to represent an entire truckload, carload or cargo. The size of a sample to be analysed for the presence of specific grading factors is established for each class of grain in its section. The term approximate is often used, allowing inspectors to take into consideration the concentration of the grading factor in the sample. Types of samples include • average sample • cargo sample • composite sample • consecutive sample • official carlot unload sample • official sample • processed sample • running sample • standard sample • submitted sample • unprocessed sample

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sample grades

Sample grades are defined in the Off-Grades of Grain and Grades of Screenings Order. Grain that is not eligible for Class I or II grades under the Canada Grain Act is graded *Sample*. With the exception of sample salvage, reference is made in all sample grades to Canada (CAN), Canada Western (CW) or Canada Eastern (CE); for example, *Barley, Sample CW Account Heated*.

Only the major grading factor forms part of the grade name. Secondary reasons for a sample grade are noted in remarks; for example, a sample of rye having a strong chemical odour and containing 9.0% by weight of heated kernels might have the following comments:

- The grade *is Rye, Sample CW/CE, Account Odour.*
- The inspector's remarks on form I-12 are *strong chemical odour, 9.0% heated.*

The remarks section of the inspection record for samples graded *Sample CW/CE/Canada* may include the following:

- For wheat, the class or classes of wheat eligible for sample grades
- The nature and concentration of admixture in samples graded Sample *CW/CE/Canad, Account Admixture*
- The kind of odour in samples graded *Sample CW/CE/Canada, Account Odour*

When sample grades are assigned, the reason shown for the grade is selected according to the Order of Precedence.

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sample interval

A sample interval is the time between the repeated sample-capturing action of a sample method or device.

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sample retention time

Sample retention times are outlined in specific Inspection procedures located online at K:\Isqms\03 – Procedure Manual\Procedures (English – French).

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sample salvage

Any grain salvaged from a wreck in transit containing over 2.5% by weight of stones or any other conspicuous ground material, removable or not, is graded *[class of grain], Sample Salvage*. For example, *Wheat, Sample Salvage*.

- Admixtures of inseparable seeds or other grains are disregarded if they do not exceed the tolerances permitted in the lowest grade of that grain.
- The composition of official samples is entered on inspection records and endorsed on the back of certificates.
- The composition of unofficial samples is shown on the face of form I-7 certificates and the I-12 form.

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sample size to be analysed

The size of a sample to be analysed for the presence of specific grading factors is established for each class of grain in its section of this guide.

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sawfly damage

The wheat stem sawfly has caused serious harvest losses to spring wheat in the prairie region. It attacks the base of stems causing tillers of mature plants to break off. Early swathing can reduce spring wheat harvest losses, but the most effective means of managing this insect pest has been the production of resistant cultivars.

See *insect damage*.

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scab damage

Scab damage refers to kernels of wheat that have been severely affected by fusarium. Scab damage is included in and assessed as fusarium damage for grade assessment. The percentage concentration of scab damage may be recorded for specific markets upon request.

- Scab kernels must be completely dull, lifeless, with a chalky appearance, and
- Must have no semblance of soundness and no visible natural wheat colour, and
- Scab kernels must have a white or pinkish fibrous growth

Note: If there is any natural wheat colour, the kernel is not to be considered as scab damage

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scalp

Scalping refers to the removal of roughage material in a sieving process.

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sclerotia

Sclerotia are hard, compact masses of fungal mycelium that serve as resting or survival structures.

One type of sclerotia is the mass of fungal tissue produced by the soil-borne fungus *Sclerotinia sclerotiorum*, which attacks crops such as sunflower and canola. Infections result in yield loss. While it does not attack cereal crops, sclerotia may be found as contaminants in samples of cereal grains from infected fields.

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screening pellets

Screening pellets are a manufactured product made by compressing dockage material to form hard cylindrical shaped pieces. Screening pellets are used in animal feed rations.

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screenings

Screenings is dockage material that has been removed by cleaning from a parcel of grain. Screenings qualify for Class IV grades. See Off-Grades of Grain and Grades of Screenings *Order*.

severely damaged

Kernels are considered to be severely damaged when

- the kernel is severely shriveled or distorted due to weather, insect, fungal and/or other reason
- in wheat, the cheeks and/or back of the kernel are ruptured

shipment order slip

The shipment order slip is given by the terminal elevator operator to the inspector in charge. It indicates the quantity and grade of grain ordered for shipment.

shrinkage allowances

Shrinkage means the loss in weight of grain that occurs in the handling or treating of grain.

Paragraph 30 of the Canada Grain Regulations specifies the maximum shrinkage allowance that may be made on the delivery of grain to any licensed elevator is zero. An order given by the CGC provides the calculation of moisture shrinkage allowed for tough, damp, moist or wet grain artificially dried at the producer's request at primary elevators.

shrunken kernels

Shrunken kernels in wheat are whole kernels that pass through a No. 4.5 slotted sieve.

See *Thin and shrunken*.

sieves

Sieves used in dockage assessment and grading procedures are listed in the Canada Grain Regulations. The accuracy of sieves used by the CGC is regularly monitored. See Chapter 3 of this guide, *Specifications for sieves*.

small oilseeds

Small oilseeds include flaxseed, canola and domestic mustard seed.

small seeds

Small seeds are considered foreign material in some classes of grain. It includes all seeds removable through a No. 4.5 round-hole sieve.

smut

See *bunt*.

soundness

Soundness refers to overall visual grain quality. Sound grain is reasonably well matured and reasonably free from kernels damaged by frost, mildew, bleaching, or weather.

special bin grain

In a primary elevator, special bin grain is held in a separate bin at the request of the owner. It is sometimes referred to as identity-preserved.

special cleaning

Special cleaning refers to any cleaning of grain in addition to the usual dockage assessment procedures. Special cleaning is used to improve the grade of the grain.

special crops

Special crops are considered to be beans, buckwheat, chick peas, corn, fababeans, lentils, mustard, peas, safflower, soybeans and sunflower.

spiral cleaner

The spiral cleaner removes flat seeds from yellow mustard seed.

stained kernels

Staining can be artificial or natural.

Artificial stain

- Includes any stain on kernels caused by contact with foreign substances such as dye or adhered foreign material such as oil, grease, paint or soot
- Does not include any stain caused by poisonous substances

Natural stain

Natural stain is any stain on kernels caused by contact with natural substances such as smut spores, soil, or weeds.

Consideration is given to the incidence of affected kernels and the nature and severity of the stain.

The nature of the adhered material is indicated on inspection records.

When the nature of the material is in doubt, the sample is sent to the Chief Grain Inspector for review, and, if necessary, for laboratory analysis.

See *weed stain*.

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standard samples

The Eastern and Western Standards Committees meet annually and recommend to the CGC primary and export standard samples of grain for use in grading during that crop year.

Primary standard samples

Primary standard samples are prepared for most grades of grain and represent as nearly as possible the minimum quality of each grade, considering the predominant grading factors in the current crop. They are used as visual guides to grading grain before and on delivery at terminal elevators, and on shipments from terminal elevators when no export standard sample is established for a grade.

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stones

Stones are hard shale, coal, hard earth pellets, and any other non toxic materials of similar consistency. Fertilizer pellets are assessed as stones, except in Domestic mustard Seed, when constituting 1.0% or less of the net sample weight. (See *Fertilizer pellets* for specific procedures to be followed when samples contain fertilizer pellets.)

Stones are considered foreign material in grain samples with the exception of corn.

Stones removed are classified as dockage if they are readily removable by ordinary cleaning methods or by special cleaning procedures.

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stowage

Stowage refers to the location or hold where grain has been loaded to a vessel.

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straight

Straight grades of grain are those within accepted limits of moisture. With increasing moisture content, grain is graded *tough, damp,* moist, or *wet*.

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submitted sample

A submitted sample is an unofficial sample sent in by a grain company or producer for grading or for other tests. The CGC charges a fee for any analysis on a submitted sample.

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terminal elevator

A terminal elevator is a licensed elevator used principally to receive grain and condition grain for export.

An inland terminal elevator is an elevator—licensed as a primary elevator —for receiving and conditioning of the grain for direct or indirect export.

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terms of delivery

Terms of Delivery refers to the deductions that will occur when a producer delivers grain in Quebec. All deductions are posted in the delivery points.

test weight

Test weight is the weight of a measured volume of grain expressed in kilograms per hectolitre. For procedures, see Chapter 1 of this guide, *Determining test weight*.

thin and shrunken

Hot dry conditions during maturation of wheat can severely reduce kernel size and cause shrunken kernels. As a result

- Test weight is reduced
- Flour yield is reduced
- More small kernels are removed during cleaning

tombstone kernels

Tombstone kernel is an obsolete term for a fusarium-damaged kernel.

tough

Grain is identified as tough if the moisture content exceeds the *straight* range established for that class of grain but is not *damp*.

treated seed and other chemical substances

Treated seed

Treated seed is grain that has been coated with an agricultural chemical for agronomic purposes. These include protection of the germinating seed from insects and pathogens, and increasing the availability of nutrients to the seed when planted. Seed treatment dressings may contain one or more insecticides or fungicides, and seed inoculants usually contain either a fungus or bacteria. Both types of seed dressings contain a dye to render the treated seed visually conspicuous. The colour of the dye varies depending upon the type of treatment and the type of grain. The current Canadian colour standards for pesticide seed treatments are: cereals- pink or red, canola - baby blue or green.

Seed treated with an inoculant may have a green stain. The coatings or stains may appear greasy or powdery and surface area distribution ranges from tiny flecks to complete coverage.

Other chemical substances

Other chemical substances refers to any chemical residues either adhering to the kernel or remaining in the sample and to samples having a chemical odour of any kind.

trier

A trier is a hollow cone-shaped device used to obtain samples manually from bagged grain.

unofficial sample

An unofficial sample is a sample drawn without the supervision of an employee of the CGC, or a CGC accredited sampling service provider.

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unprocessed sample

Unprocessed samples of grain are those which have not been cleaned commercially.

See also *processed sample*.

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unregistered variety

Unregistered variety is sometimes used for the term non-registered variety.

See *registered variety*.

Variety Order List

The Variety Order List lists the varieties of seeds that have been registered for production in Canada under the authority of the Canada Seeds Act. Section 28 of the Canada Grain Act authorizes the grading of varieties not included under the Order into the lowest grade established by regulation for that kind of grain.

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vomitoxin

Vomitoxin or deoxynivalenol is a mycotoxin produced by *Fusarium graminearum*.

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weathered

Weathered is the deterioration in visual appearance of grain from its natural state, which may impact its end use functionality. Weathering is the result of exposure to environmental conditions such as: freezing temperatures, excessive heat, and rain. The degree of damage that results is dependent upon the length of time grain is exposed to, and the severity of the adverse weather conditions.

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weed stain

A weed stain is a type of natural stain. A weed stain refers to

- The blotched or stained appearance of kernels caused by contact with the sap from green foliage of such weeds as Russian thistle
- Kernels with adhered foliage of weeds

Western Certificate (Eastern Division)

The Western Certificate (Eastern Division) is an export certificate issued in eastern Canada for corn loaded to a laker. It includes a statement of agreement between the shipper and purchaser indicating further inspection is not required.

1. The shipper originates the request for this type of certification before shipment.
2. The Western Certificate is issued to indicate quality at initial loading.
3. Any subsequent handling that increases breakage and lowers the grade becomes the responsibility of the buyer rather than the seller.

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wet

A sample of grain is identified as wet if the moisture content exceeds the moist range established for that class of grain. With increasing moisture content, grain is graded *straight, tough, damp, moist*, or *wet*.

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wheat classes

The following wheat classes are produced in Canada and are graded according to specifications detailed in the Guide.

Canada Western/Eastern Amber Durum (CWAD) (CEAD)
Canada Western Red Spring (CWRS)
Canada Western Hard White Spring (CWHWS)
Canada Western Red Winter (CWRW)
Canada Prairie Spring Red (CPSR)
Canada Prairie Spring White (CPSW)
Canada Western Extra Strong (CWES)
Canada Western/Eastern Soft White Spring (CWSWS) (CESWS)
Canada Western Special Purpose (CWSP)
Canada Eastern Hard White Winter (CEHWW)
Canada Eastern White Winter (CEWW)
Canada Eastern Red (CER)
Canada Eastern Red Spring (CERS)
Canada Eastern Hard Red Winter (CEHRW)
Canada Eastern Soft Red Winter (CESRW)
Canada Eastern Hard White Spring (CEHWS)

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wheats of other classes

Other classes of wheat are all classes of wheat including non-registered varieties, other than the predominant class in the sample. Contrasting classes are classes of different coloured wheat; for example CWAD is a contrasting class in CWRS.

Note: CWHWS is considered a WOOC for grading purposes in samples of CWRS.

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wild oats

Wild oats is an annual grassy weed. It reduces crop yield, increases dockage and cleaning costs, lowers the grade, and is costly to control. Seeds of wild oats vary in colour from white to black. They are normally more slender than domestic oats and have a slanting, circular, depressed scar—sometimes called a sucker mouth—at their base, and a bent twisted awn.

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www.grainscanada.gc.ca

The World Wide Web address for the Canadian Grain Commission.